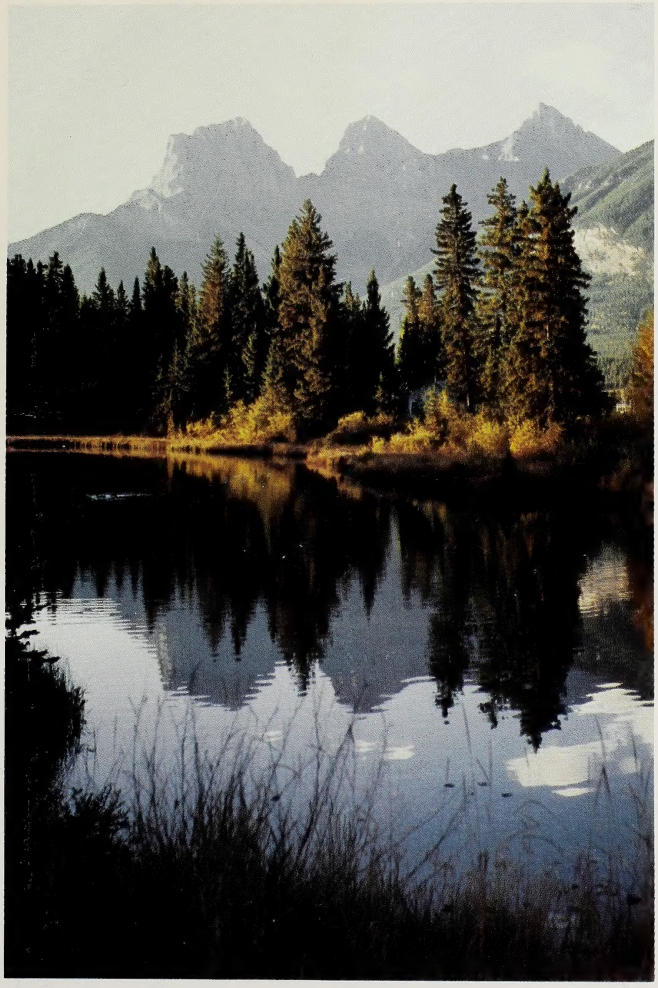
AL.21992-355c2

BOW-CANMORE

VISUAL IMPACT ASSESSMENT REPORT



Alberta Tourism

March, 1991

National Library of Canada
Bibliothèque nationale du Canada

CANADIANA

AUG - 6 1991

Alberta
TOURISM

Office of the Deputy Minister

6th Floor, CityCentre, 10155 - 102 Street, Edmonton, Alberta, Canada T5J 4L6 403/427-4368 Fax 403/427-2852

To Whom It May Concern:

The Bow-Canmore Visual Impact Assessment was initiated by Alberta Tourism as a component study of the Bow-Canmore Tourism Development Framework. The Framework's purpose is to provide information for the use of the public and private sectors, non-profit organizations and the public at large in the planning and decision-making for tourism development within the Bow-Canmore valley.

The Bow-Canmore valley features the spectacular mountain landscape of the Canadian Rockies. The high natural scenic value of the area is a primary resource. This Visual Impact Assessment was undertaken as a means of assessing the visual quality of the area and developing a methodology for sustaining the areas natural beauty. It is a study that is unique within the Province of Alberta for two reasons: 1) it marks the first time that visual quality and potential visual impacts from development within a given area have been so comprehensively examined; and 2) it marks the first time in Alberta that current computer technology has been extensively used and integrated into the process of visual impact assessment.

It is acknowledged that this study is not the definitive word on the subject of visual impact assessment within the Bow-Canmore valley. This study does, however, attempt to establish a firm base on which further work on the assessment of visual impact can be built, whether alteration to the area's landscape is proposed as a result of tourism development or for any other reason. In this regard, the Bow-Canmore Visual Impact Assessment is intended to provide valuable information as a reference document and be a useful model for future analyses. With further examination and discussion, the concept of sustaining visual quality can be fully realized as a positive component of growth and development in the Bow-Canmore area.

It should be noted that this study was conducted by an independent consultant commissioned by Alberta Tourism. As such, this study does not represent government policy, nor does it imply any commitment to implementation at this time.

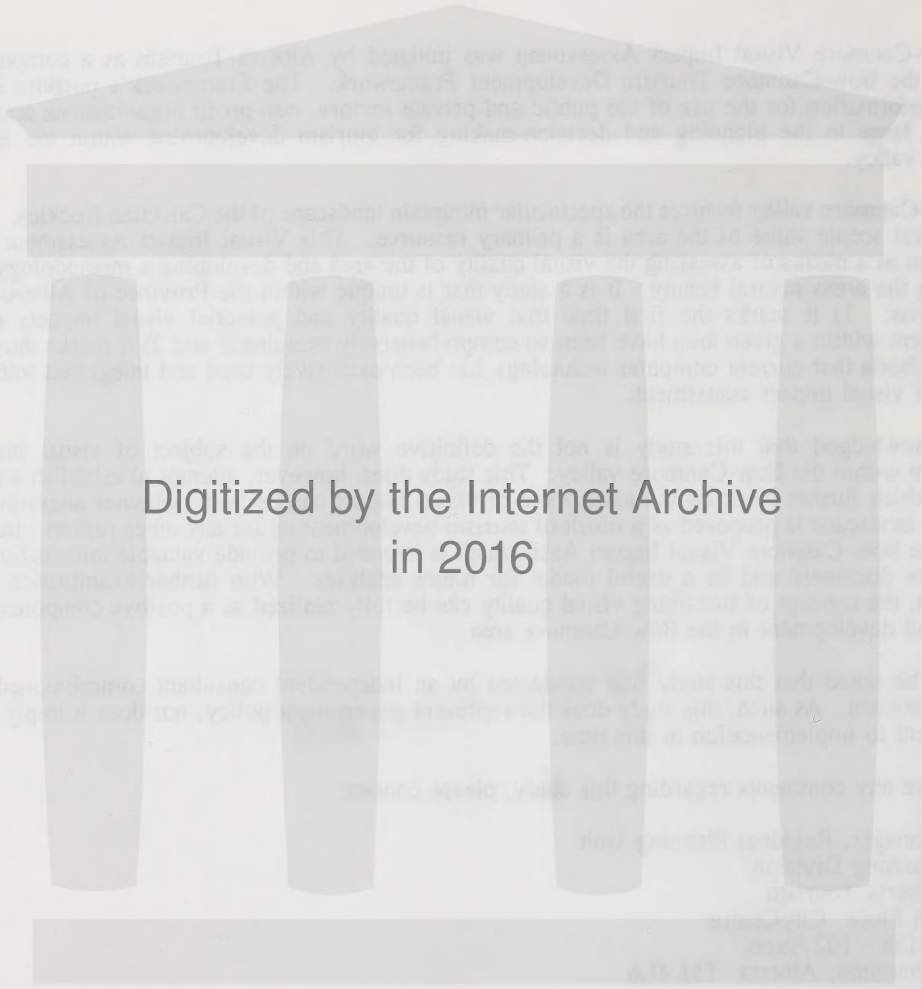
If you have any comments regarding this study, please contact:

Manager, Regional Planning Unit
Planning Division
Alberta Tourism
5th Floor, CityCentre
10155 - 102 Street
Edmonton, Alberta T5J 4L6

Additional copies of this report are available by contacting the above address or by telephoning 427-2501.

Yours sincerely,

Bernard F. Campbell
Deputy Minister



Digitized by the Internet Archive
in 2016

https://archive.org/details/bowcanmorevisual00albe_1

Prepared for:

Alberta Tourism
5th Floor City Centre
10155-102 Street
Edmonton, Alberta
Canada T5J 4L6
(403) 427-2501

Prepared by:

Landplan Associates Ltd.
201, 1414 Kensington Road NW
Calgary, Alberta
Canada T2N 3P9
(403) 283-2777

Design Workshop, Inc.
710 East Durant Avenue
Aspen, Colorado 81611
U.S.A.
(303) 925-8354

March, 1991

Printed on Recycled Paper

ACKNOWLEDGEMENTS

This project was initiated by Alberta Tourism. The study was prepared by Landplan Associates Ltd. and Design Workshop Inc. with participation by the project Steering Committee and a local public group.

Gratitude is extended to the following individuals who gave of their time and energy.

Steering Committee Members

Alberta Tourism
Mr. Randy Leal (Chairperson)
Tourism Planning Coordinator

Mr. Siu Yu
Landscape Architect

Alberta Energy
Mr. Kevin Williams
Resource Planner

Alberta Environment
Mr. Richard Bramm
Environmental Coordinator

Alberta Forestry, Lands and Wildlife
Mr. David Buckley
Senior GIS Analyst

Ms. Marilyn Rayner
Manager, Resource Analysis

Ms. Jennifer Steber
Resource Planner

Alberta Municipal Affairs
Mr. Mike Sandford
Planner

Alberta Transportation and Utilities
Ms. Joanne Dorais
Landscape Architect

Mr. Ed Hammond
Head, Aerial Surveys and Remote Sensing

Mr. Don Snider
Manager, Environmental Affairs

Calgary Regional Planning Commission
Mr. Miles Cullum
Supervisor, Rural Planning Services

MD of Bighorn No. 8
Mr. Steven de Keijzer
Municipal Manager

Town of Canmore
Mr. Paul Bates
Director, Planning and
Economic Development

Ms. Sally Deutschmann
Economic Development Coordinator

Public Group Participants

Ms. Lorraine Fraser, Mr. Michael Sternloff, Mr. Lorne Perry, Mr. Lenze Kuiper, Mr. Roger Vernon, Ms. Lorraine Christensen, Mr. Tim Auger, Mr. Len Upton, Ms. Linda Hammell, Ms. Joan Knight, Mr. Hal Walker, Mr. Pat Morrow, Mr. Ken Frank, Ms. Karen Aulik, Mr. Wally Drew, Ms. Sandra Leckie, Mr. Pierre Damnon, Mr. Tommy Snow, Mr. Bill Tilleman, Mr. Ernie Elkins, Mr. Glen Nelson.

EXECUTIVE SUMMARY
BOW-CANMORE VISUAL IMPACT ASSESSMENT

INTRODUCTION

- Bow-Canmore Tourism Development Framework

  In recent years, there has been increasing interest in the further development of tourism facilities in the Bow-Canmore area east of Banff National Park. Alberta Tourism, in recognizing the variety and complexity of issues associated with development in this area, has undertaken the task of coordinating the preparation of the Bow-Canmore Tourism Development Framework. Through the examination of several key issues, the Framework is intended to provide specific information and recommendations for the use of the public and private sectors, as well as non-profit organizations throughout the initial planning and decision-making phases of development.

- Bow-Canmore Visual Impact Assessment

  The issue of development impacting on visual and aesthetic quality in the Bow-Canmore area was identified early on as a key issue that needed to be investigated within the Framework. As a consequence, the Bow-Canmore Visual Impact Assessment was undertaken to explore potential impacts and seek the means by which they might possibly be diminished or averted.

- Purpose of this study

  The specific purpose of this study is to determine a methodology for sustaining the visual quality of the landscapes within the Bow-Canmore valley in relation to future development. It is intended that this methodology can be suitably applied as development proceeds within the valley. In this regard, the study outlines suggestions as to how this methodology could be implemented by proponents, planners, land use administrators and regulatory agencies at both the municipal and provincial levels.

- Final Products

  The final products of the Bow-Canmore Visual Impact Assessment consist of three documents: *Report, Technical Appendix* and *Design Manual*. Of significant importance are maps within the study which illustrate Visual Quality Objectives and a set of associated and referenced visual quality guidelines. These guidelines form the basis for recommendations regarding visually sensitive landscapes and their appropriate treatment during the planning and decision-making phases leading to development.

STUDY AREA

The Bow-Canmore Visual Impact Assessment focuses on the area extending east from the Banff National Park boundary, along the Bow River valley approximately 33 kilometres, to the Hamlet of Seebe. Historically, land use studies within this valley have been defined within municipal, provincial or federal jurisdictional boundaries. For the purpose of assessing visual impacts, however, this study has defined "visual boundaries" which predominantly follow ridgelines as they are seen from the valley floor.

METHODS AND RESULTS

The methodology employed in this assessment of visual impacts within the Bow-Canmore valley involved four major tasks. These were:

- Inventory of existing conditions and evaluation of visual quality;
- Mapping of Visual Quality Objectives and establishment of most important viewpoints;
- Determination of acceptable levels of modification and importance of viewsheds; and
- Development of visual quality guidelines and implementation strategies.

1. Inventory of existing conditions and evaluation of visual quality.

   The Bow-Canmore valley shares the spectacular mountain landscape of the Canadian Rockies drawing four million visitors to the region each year. From 1917 to 1930 the area as far east as Exshaw was actually included within the boundaries of Banff National Park. Today, the visual character of the area is distinguished by the contrast of manmade development in juxtaposition with natural scenery. The existing landscape character of the area is described in a map which illustrates thirteen *landscape character types*. This map provides an inventory and summary of existing conditions with respect to the landscape within the study area. To evaluate the existing visual quality within the Bow-Canmore valley, a representative public group was brought together. These individuals, selected from the public at large, were called upon as residents from the area, workers employed in the area, or as recreationists who frequently enjoy spending time in the valley, but reside elsewhere. With their guidance, *visual quality ratings* were assigned to each of the thirteen landscape character types.

2. Mapping of Visual Quality Objectives and establishment of most important viewpoints.

   The analysis of information and the mapping of results was achieved through the use of computer technology. Key interpretive maps were derived from the analysis of information provided from available base data and the input of the public group. The most important of these derived or computer generated maps was a map which illustrates Visual Quality Objectives. This map suggests a classification of the landscapes within the Bow-Canmore valley in terms of *appropriate levels of change*. These categories of change are "Full Protection", "Partial Protection", "Modification and Improvement" and "Improvement". It is preferable that manmade intervention take place only in the latter three categories. Generally, the range of visual intervention should be as follows:

   a) "Full Protection" - no manmade development; ecological change only
   b) "Partial Protection" - very sensitive low impact development is appropriate; human intervention should be unobtrusive to residents or visitors and should not detract from the natural scenic quality.
   c) "Modification and Improvement" - quality development and redevelopment is appropriate; human activity may dominate the characteristic landscape, but should use naturally established form, line, colour and texture and should appear close to a natural occurrence when viewed in the foreground; existing conditions should be enhanced in scenic value and quality.
   d) "Improvement" - rehabilitation is appropriate; existing conditions should be enhanced in scenic value and quality.

   The public group was also called upon to assist in the selection of key viewpoints throughout the study area. It was necessary to establish which, of the many viewpoints in the valley, were the most important for two reasons. Firstly, there was a need to identify representative views so that development scenarios could be visually simulated and then

evaluated. Secondly, as many areas are out of the line of sight when viewed from certain viewpoints, there was a need to identify the level of importance of seen and unseen areas.

Eighteen important viewpoints were initially identified. Of these, eleven were later selected for simulation. The choice of eleven viewpoints was considered appropriate since eleven of the valley's thirteen landscape character types were classified within the range of visual intervention deemed, by the group, to be acceptable. Finally, the most important viewpoints were the top eight determined following the analysis of the results of two exercises that the public group was involved in: one cognitive and one selective. Areas of scenic significance based on ecological, recreational or cultural/historic resource values were also considered important.

3. Determination of acceptable levels of modification and importance of viewsheds.

Once the landscapes had been categorized within a range of visual intervention (i.e. "Full Protection", "Partial Protection", "Modification and Improvement", and "Improvement"), it was necessary to determine more precise levels of landscape change. Of the eighteen viewpoints initially identified as being the most important, eleven had been selected for computer simulations that would illustrate a variety of possible development scenarios. These scenarios demonstrated the range of visual intervention that could result given the scale and type of development being considered within the study area.

The public group was then called upon to evaluate the visual quality of the modified landscape views that had been simulated and that illustrated various possible development scenarios. Through the interpretation of this evaluation of visual quality within altered landscapes, acceptable levels of modification were identified.

Analysis of the results of this exercise suggested the following:

- Foreground development has considerably more impact than more distant, middle, or background development. Foreground distance was defined as being within one kilometre of the viewpoint.

- Golf course development is generally perceived as a positive visual feature as long as the clearing patterns in forested areas appear natural and because grass green patches provide increased diversity on the forested slopes.

- The removal of fences or trails was considered to be only a minor improvement, while the development of roads in natural areas was considered to be a negative impact. The widening of an existing highway interchange, however, did not impact either way on visual quality.

- Within the Town of Canmore, tree planting along streets and the addition of more attractive lamp posts were perceived as visual improvements. Pedestrianisation of a section of the main street was also recommended.

- Roadside strip development rated negatively throughout.

- Reclaimed and revegetated mining scars were rated significantly higher in terms of visual quality than existing mining conditions. Painting schemes for industrial plants were simulated on the computer and only colours closely resembling the natural landscape were rated as being an improvement. The simulation illustrating restored natural conditions was rated very highly.

Following the determination of acceptable levels of modification, it was necessary to establish the importance of viewsheds in terms of the frequency with which they are seen.

A "viewshed" is defined as a visible area, as it appears from one or more viewpoints. The importance of viewsheds within the study area was established with the aid of a computerized analysis of views from viewpoints along Highways 1 and 1A and the eight viewpoints previously identified by the public group as being the most important. This analysis determined how frequently various areas were visible from all of these viewpoints. Viewsheds most visible from both the eight viewpoints and the two highways were considered, by the public group, to be the most important. Those that were not seen from these points were considered to be less important and thus were not deemed to require as stringent an application of the Visual Quality Objectives and the visual quality guidelines as those seen more frequently.

4. Development of visual quality guidelines and implementation strategies.

   The identification of areas where potential development may result in supportive, neutral or conflicting visual impacts was a key step leading to the final development of visual quality guidelines and implementation strategies. This was achieved through a comparative analysis of maps illustrating the most current information available regarding potential development within the study area and the map illustrating lands implicated by the study's Visual Quality Objectives.

CONCLUSIONS, RECOMMENDATIONS AND IMPLEMENTATION STRATEGIES

The study's *Visual Quality Objectives* map suggests the following levels of landscape alteration to landscape character types as a preferred and recommended means of promoting the most appropriate visual concept for future land use in the Bow-Canmore valley: that of "change to sustain natural beauty".

- "Full Protection" should apply to rivers, lakes and high mountain peaks.
- "Partial Protection" should apply to coniferous forests, mixed vegetated areas, meadows, reservoirs and minor impacts to water and vegetated areas.
- "Modification and Improvement" should apply to major roadways, towns, hamlets and highway commercial development.
- "Improvement" should apply to areas affected by mining activity.

To sustain the visual quality of the Bow-Canmore area, the following general concepts should be considered.

- The Visual Quality Objectives of the *Bow-Canmore Visual Impact Assessment-Report* should be followed to the maximum extent.
- Natural features such as riparian areas, the benchlands and the hoodoos should be protected.
- Elements within the valley's less attractive landscape character types such as major roadways, highway commercial development and mining sites should be improved.
- Sites for new development should be located so that "visibility" is minimized.
- New development should be in a form that is visually harmonious with the natural environment.

- The development guidelines described in the *Bow-Canmore Visual Impact Assessment-Design Manual* should be appropriately applied to the built environment throughout the conceptual design, planning and construction phases of development.

The following recommendations outline a strategy for the implementation of the Bow-Canmore Visual Impact Assessment.

- The Bow-Canmore Visual Impact Assessment should be used as a reference in the recommended review of existing land use controls (ie. zoning) based on the results of the comparison between Development Potential and the Visual Quality Objectives.

- The *Bow-Canmore Visual Impact Assessment-Design Manual* should be used by proponents, planners and administrators as a reference in:

  a. Reviews of development applications (consideration should be given to include a visual impact assessment wherever it is deemed to be appropriate);
  b. Location of public works based on visual criteria; and
  c. Land acquisition and scenic easements to be based on Visual Quality Objectives and Landscape Character, as well as important viewsheds wherever it is deemed to be appropriate.

- When an Environmental Impact Assessment is required in the review of any development proposal within the Bow-Canmore valley, a visual impact assessment component should be included. Computer simulation and GIS analysis may become essential tools in this type of assessment.

- The process employed in the Bow-Canmore Visual Impact Assessment and described in the *Design Manual* and the *Technical Appendix* may be referenced as a model in establishing a methodology for the visual impact assessment component of Environmental Impact Assessments.

- Public involvement is a key element in the visual review process. A local public group should be established to provide the opportunity for further public involvement in the visual review process. Such a group would also create a non-confrontational forum for discussion among proponents and opponents of development.

TABLE OF CONTENTS

		PAGE
	EXECUTIVE SUMMARY	i
1.	INTRODUCTION	1
	1.1 Products	1
	1.2 Study Area Definition	2
	1.3 Methodology	3
2.	METHODS AND RESULTS	7
	2.1 Inventory of Existing Conditions	7
	2.1.1 Creation of a Geographic Information System (GIS) Database	7
	2.1.2 Photographic Inventory	7
	2.1.3 Landscape Character Map	7
	2.2 Mapping of Visual Quality Objectives and Establishment of Most Important Viewpoints	7
	2.2.1 Definition of Visual Quality and Its Defensibility (Delphi Process)	7
	2.2.2 Rating of Visual Quality	8
	2.2.3 Comparison of Public Group's Evaluation With Others	13
	2.2.4 Visual Character Concept	14
	2.2.5 Relationship Between Visual Quality and Visual Quality Objectives	14
	2.2.6 Creation of Visual Quality Objectives Map	15
	2.2.7 Mapping of Important Viewpoints	16
	2.3 Determination of Acceptable Levels of Modification and Importance of Viewsheds	22
	2.3.1 Development of Modified Scenarios	22
	2.3.2 Rating of Acceptable Levels of Landscape Change	22
	2.3.3 Viewshed Analysis and Importance of Viewsheds	31

PAGE

3. DEVELOPMENT OF GUIDELINES AND IMPLEMENTATION STRATEGIES 39

3.1 The Design Manual 39

3.2 Comparison of Visual Quality Objectives with Existing Land Use Controls 39

3.2.1 Comparison of Visual Quality Objectives and Land Suitability 40

3.2.2 Comparison of Visual Quality Objectives and Wildlife Suitability 43

3.2.3 Comparison of Visual Quality Objectives and Development Potential 44

3.2.4 Comparison of Visual Quality Objectives and Potential Development Envelopes 47

3.3 Implementation Strategies 48

GLOSSARY OF TERMS 51

BIBLIOGRAPHY 55

APPENDICES 57

APPENDIX I: MAPS 59

APPENDIX II: DATA FLOWCHARTS 77

APPENDIX III: DELPHI GROUP MEETINGS AND RESULTS 83

LIST OF FIGURES

		PAGE
1.	Bow-Canmore Visual Impact Assessment-Process Flowchart	5
2.	Data Flowchart for Landscape Character Map	11
3.	Visual Quality Ratings by Landscape Character Type	13
4.	Visual Quality Objectives in Relation to Rating of Visual Quality	15
5.	Visual Quality Objectives and Visual Quality in Relation to Landscape Character Types	16
6.	Eight Most Important Views-Table	21
7.	Eight Most Important Views-Photographs	23
8.	Computer Simulated Views from Viewpoint #20	25
9.	Computer Simulated Views from Viewpoint #42	27
10.	Computer Simulated Views from Viewpoint #5	29
11.	Diagram Illustrating "Viewshed"	32
12.	Visual Impact: Visual Quality Objectives and Land Suitability	43
13.	Visual Impact: Visual Quality Objectives and Wildlife Suitability	44
14.	Visual Impact: Visual Quality Objectives and Development Potential	47
15.	Visual Impact: Visual Quality Objectives and Potential Development Envelopes	48

LIST OF MAPS

		PAGE
1.	Location Map of Study Area	3
2.	Landscape Character	9
3.	Visual Quality	17
4.	Visual Quality Objectives	19
5.	Viewpoint Locations for Viewshed Generation	33
6.	Unseen Areas from Highways 1, 1A, and Eight Most Important Viewpoints	35
7.	Comparison of Visual Quality Objectives and Land Suitability	41
8.	Comparison of Visual Quality Objectives and Development Potential	45

1. INTRODUCTION

The visual character of the Bow-Canmore valley is presently defined by the contrast of manmade development in juxtaposition with natural scenery. In recent years there has been increasing development pressure in this valley east of Banff National Park. These pressures from mining companies, resort developers and commercial industries are threatening to change the visual quality which attracts visitors and is a basic part of the residents' quality of life.

Alberta Tourism, in recognizing the complexity of issues associated with development in this area, has undertaken the task of coordinating the preparation of the Bow-Canmore Tourism Development Framework. The Bow-Canmore Visual Impact Assessment is one of the components of this Framework. The objective of this study is to determine a method of sustaining the visual quality of the environment in relation to future development.

As part of the study, a map illustrating Visual Quality Objectives has been prepared, with a related set of visual quality guidelines. The guidelines for the protection of the visual resources of the Bow-Canmore Valley are not intended to restrict development. These guidelines are intended to help developers and administrators accurately evaluate development proposals in terms of impact on the visual resources so that the proposed developments might be designed to be publicly and visually acceptable.

1.1 Products

The final products of this study are comprised of the following:

1) *Bow-Canmore Visual Impact Assessment-Report*

This document describes the process that was used to determine the method and means of sustaining the visual quality of the Bow-Canmore valley. It may be used as a guide to establishing a methodology for the visual impact assessment component of any environmental impact assessments required in the valley.

2) *Bow-Canmore Visual Impact Assessment-Technical Appendix*

The *Technical Appendix* provides more detailed information regarding the computerized derivation of data for this study, as well as further explanation of the methodology. It should be used as an appendix to the *Bow-Canmore Visual Impact Assessment-Report*, providing technical clarification as necessary.

3) *Bow-Canmore Visual Impact Assessment-Design Manual*

This document is intended for use by proponents, planners and administrators of development in the valley. It may be used following an overview of the *Executive Summary* in the *Report*. The *Design Manual* may also be appropriately applied to the built environment throughout the conceptual design, planning and construction phases of development.

4) *Bow-Canmore Visual Impact Assessment-Slide Presentation*

This *Slide Presentation*, with an accompanying written text, is intended for use as an introduction to the visual impact assessment process in the valley. It is organized in

three sections; firstly, a general introduction to visual impact assessments; secondly, the methodology used in this assessment and the findings; and thirdly, the implementation of the findings and guidelines for visually appropriate development.

5) *Bow-Canmore Visual Impact Assessment-Digital Tapes of Maps*

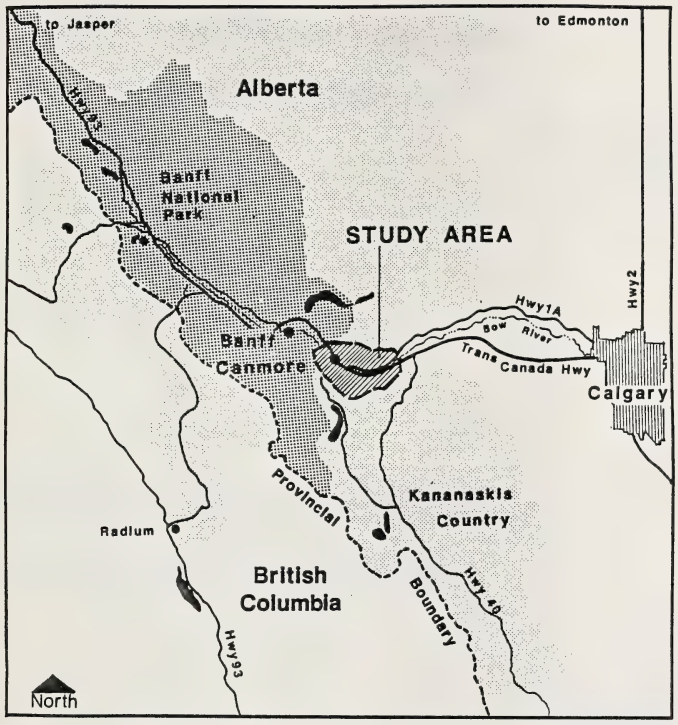
All the original computer base data as well as the new maps that have been generated are available in digital format for use in future studies in the Bow-Canmore valley.

1.2 Study Area Definition

The study area is within a glacial river valley at the eastern foot of the Rocky Mountains. It spans a distance along the valley of approximately 33 kilometres stretching from the eastern boundary of Banff National Park to the Hamlet of Seebe.

Flowing along the valley, the Bow River is bordered on both sides by transportation corridors. The Trans Canada Highway is the major east/west travel route with an average annual daily traffic count (both ways) in 1989 of 10,130 vehicles per day through this area. Highway 1A and the Canadian Pacific Railway are the other main transportation routes. The study area contains the Town of Canmore as well as the Hamlets of Seebe, Exshaw, Dead Man's Flats, Harvie Heights and Lac Des Arcs.

Historically, land use studies within the Bow-Canmore Valley have been defined by political boundaries. The study area for the Bow-Canmore Visual Impact Assessment was defined by visual boundaries, predominantly ridgelines, as experienced from the valley floor (see Map 1: *Location Map of Study Area*).



MAP 1:
Location Map of Study Area

1.3 Methodology

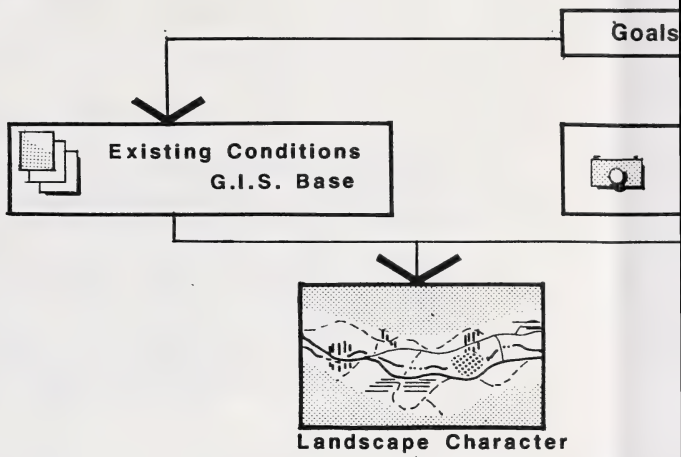
The Bow-Canmore Visual Impact Assessment comprised four major tasks:

1. Inventory of existing conditions and evaluation of visual quality;
2. Mapping of Visual Quality Objectives and establishment of most important viewpoints;
3. Determination of acceptable levels of modification and importance of viewsheds; and
4. Development of visual quality guidelines and implementation strategies.

Technical support for the study was accomplished using computer technology. In particular, a Geographic Information System (GIS) was used to develop a computer database of existing information and for further analysis of this information. A PC based computer "paint" system and an IRIS computer for three-dimensional modelling were used to create simulated images of potential future conditions which were used in work sessions with a local public group. The public group work sessions were held in order to identify visual quality and to evaluate potential future conditions. (See Figure 1: *Bow-Canmore Visual Impact Assessment-Process Flowchart* for a graphic summary of the methodology which is also explained fully in the following text).

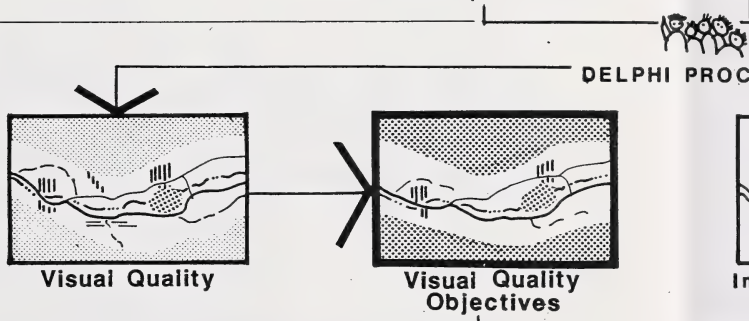
1. INVENTORY OF EXISTING CONDITIONS

AND EVALUATION OF VISUAL QUALITY



2. MAPPING OF VISUAL QUALITY OBJECTIVES

AND MOST IMPORTANT VIEWPOINTS



3. DETERMINATION OF ACCEPTABLE LEVELS OF

MODIFICATION AND IMPORTANCE OF VIEWSHEDS

4. DEVELOPMENT OF GUIDELINES

AND IMPLEMENTATION STRATEGIES

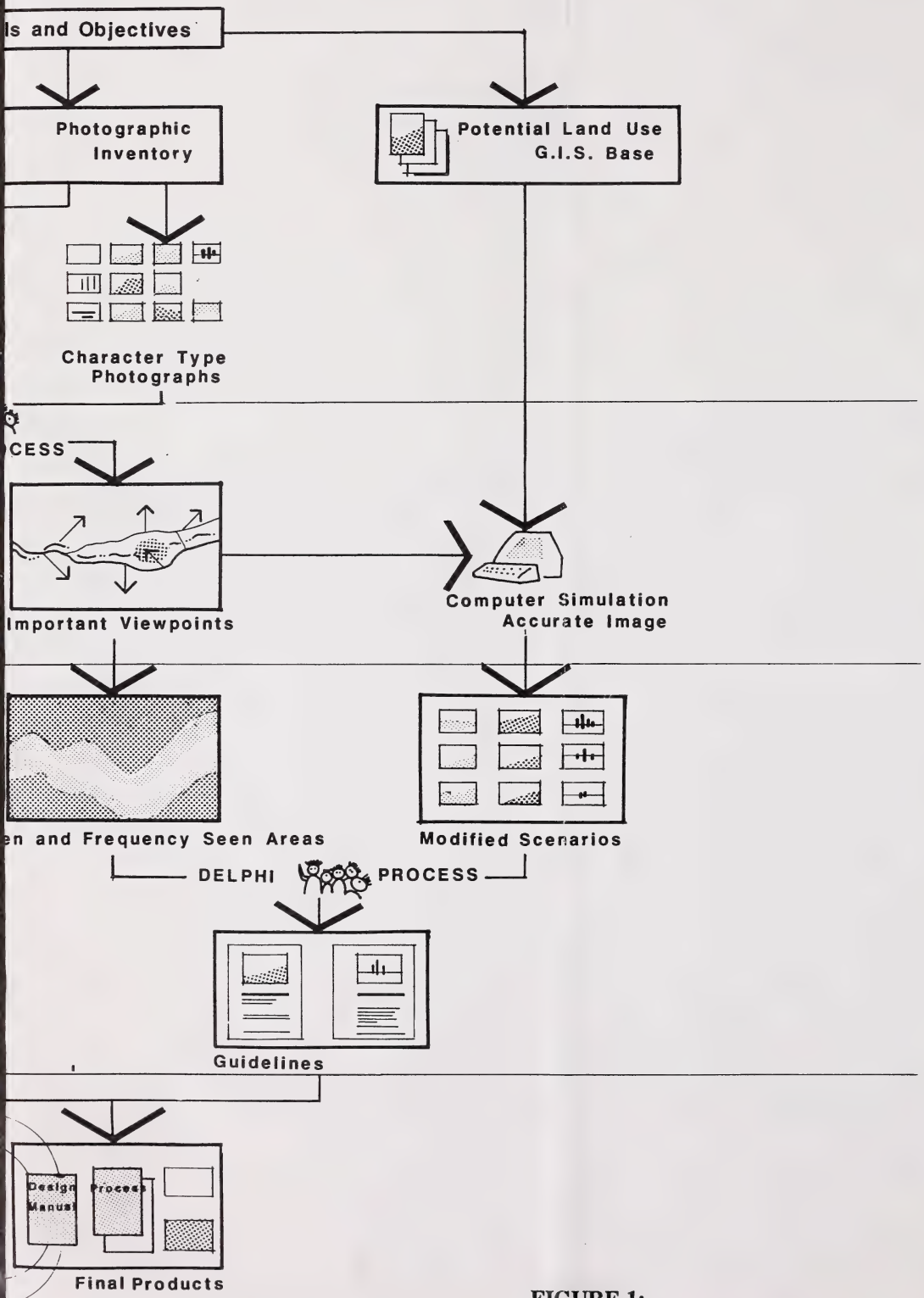


FIGURE 1:
Bow-Canmore Visual Impact Assessment Process Flowchart

2. METHODS AND RESULTS

2.1 Inventory of Existing Conditions

2.1.1 Creation of a Geographic Information System (GIS) Database

Existing information was collated to create a database for the Geographical Resources Analysis Support System (GRASS) Geographic Information System (GIS). This included digital data provided by Alberta Forestry, Lands and Wildlife from which the following base maps were developed: *Elevation, Hydrology*, and *Transportation*. The remaining maps were hand digitized from the most recent information available, including the "Bow Corridor Local Integrated Resource Plan - Draft Plan" and the "Ecological Land Classification Ecosite Map", also provided by Alberta Forestry, Lands and Wildlife. These maps included *Vegetation, Existing Land Use, Potential Development, Zoning, Ecology* and *Areas of Scenic Significance*. A fully illustrated list of base maps and their derivation is contained in the *Technical Appendix*.

2.1.2 Photographic Inventory

A photographic inventory was conducted during July, 1990. Therefore all visual quality evaluation is based on summer conditions. Photographs and slides were taken primarily from major transportation routes or high use areas. The viewpoint locations were mapped on a 1:20,000 topographical map. The photographs represented a diverse range of conditions in the study area. (See *Appendix*, Map 1: *Viewpoint Locations for Evaluation* which shows the locations of the viewpoints for the 69 photographs used in the public group sessions).

2.1.3 Landscape Character Map

The landscape character of the area was classified into thirteen types based on a typical landscape classification scheme (similar, for example, to the National Land Capability Classification Systems of the Canada Land Inventory) and a photographic sorting exercise.

The resulting map comprises thirteen landscape character types which range from most natural, such as rocky mountain peaks or coniferous forests, through minor impacts to vegetated areas or water, to manmade developments such as hamlets, roads, or mining (see Map 2: *Landscape Character*). This map was created in GRASS by programming criteria for each of the landscape character types and developing a prioritized method for combination of the types (see Figure 2: *Data Flowchart for Landscape Character Map*).

2.2 Mapping of Visual Quality Objectives and Establishment of Most Important Viewpoints

2.2.1 Definition of Visual Quality and its Defensibility by Involving a Public Group

"Visual Quality" is defined in the book Foundations for Visual Project Analysis (Smardon, et al, 1986) as follows:

> The visual significance given to a landscape determined by cultural values and the landscape's intrinsic physical properties. (A.C.E., 1984). While many factors contribute to a landscape's visual quality, they can ultimately be grouped under three headings: vividness, intactness, and unity. Analogous concepts: scenery quality rating (B.L.M.), variety class (U.S.F.S.). (Jones and Jones, 1977.)

Thus, a landscape that is described as "beautiful" should have a high degree of "vividness, intactness and unity".

Recent research suggests that visual quality as defined by "experts" or professionals in the field is virtually identical to visual quality as defined by the general public. More particularly, while it is commonly stated that beauty is in the eye of the beholder, it has been found that a broad spectrum of people define levels of visual quality ranging from "beautiful" to "ugly" fairly consistently. Thus the most defensible proof of an area's visual quality is that defined by the general public.

As a means of addressing the issue of subjectivity and defensibility within this study, a public group was called upon to evaluate visual quality and determine acceptable levels of change to the existing conditions. The group consisted of twenty-one men and women familiar with the area through their work, residency or recreational pursuits. They represented a broad spectrum of individuals which included resort developers, photographers, hikers, members of local municipal authorities and others. All were invited to participate by Alberta Tourism in two group work sessions. The first session was organized to evaluate visual quality in the study area. The second was organized to determine acceptable levels of modification. Important viewpoints and their viewsheds were also identified at the first session.

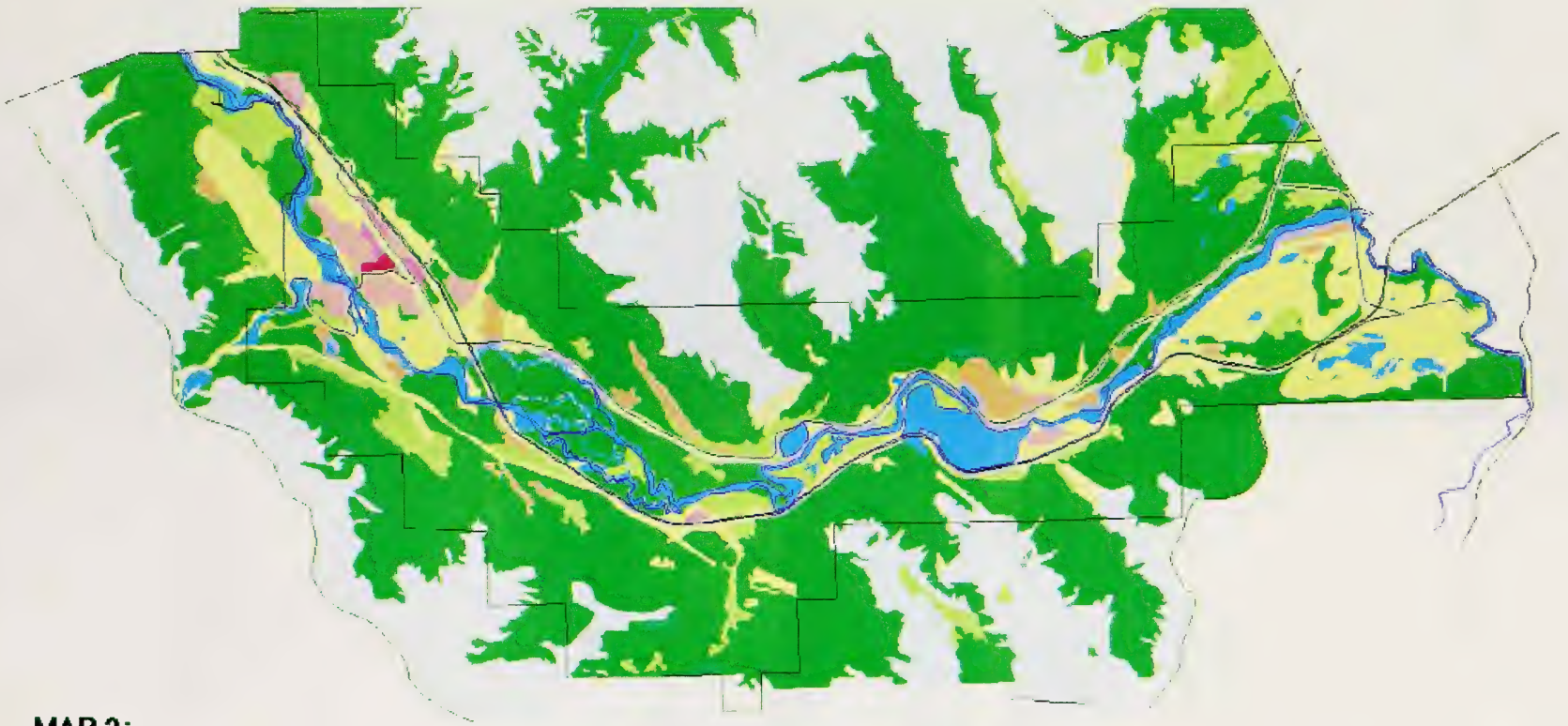
Within the two sessions, two primary methods were used to elicit group responses. These were cognitive mapping exercises and selective exercises. Cognitive exercises involved locating important viewpoints on 1:50,000 scale maps of the study area. Selective exercises included evaluating the visual quality of representative colour slide images of the study area. The initial cognitive exercises were undertaken by subgroups of four to five individuals with all group results then collated and ranked. Following these, the Delphi technique was used in the selective exercises to achieve a consensus of opinion among the individuals of the group on issues such as visual quality.

The Delphi technique was developed by RAND Corporation employees who were dissatisfied with the way committees laid plans for the future. Committee decisions, they found, were often influenced by the dynamics of the personalities involved and often failed to represent a true consensus among the individual participants. In the Delphi process, each person responds individually to a questionnaire. Their answers are compiled and the results are then made known to the group. Individuals are then asked to reconsider their responses knowing the average response of the group. Two to three iterations are usually enough to achieve consensus. This technique has been utilized in a number of planning situations where it has proved successful for gaining fair and representative opinions on a variety of issues.

2.2.2 Rating of Visual Quality

Sixty-nine photographic slides were shown to the group. These slides were representative of the area and were classified in accordance with the area's thirteen landscape character types. The Delphi process was used in the evaluation of these slides to achieve a consensus on a rating of visual quality within the study area. The scale on which visual quality was rated, in this case, ranged from "most beautiful" to "most ugly".

Although the use of these particular terms seems to be somewhat blunt, the terminology is commonly accepted within the process of visual assessment. This preference for more



MAP 2:
LANDSCAPE CHARACTER
Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

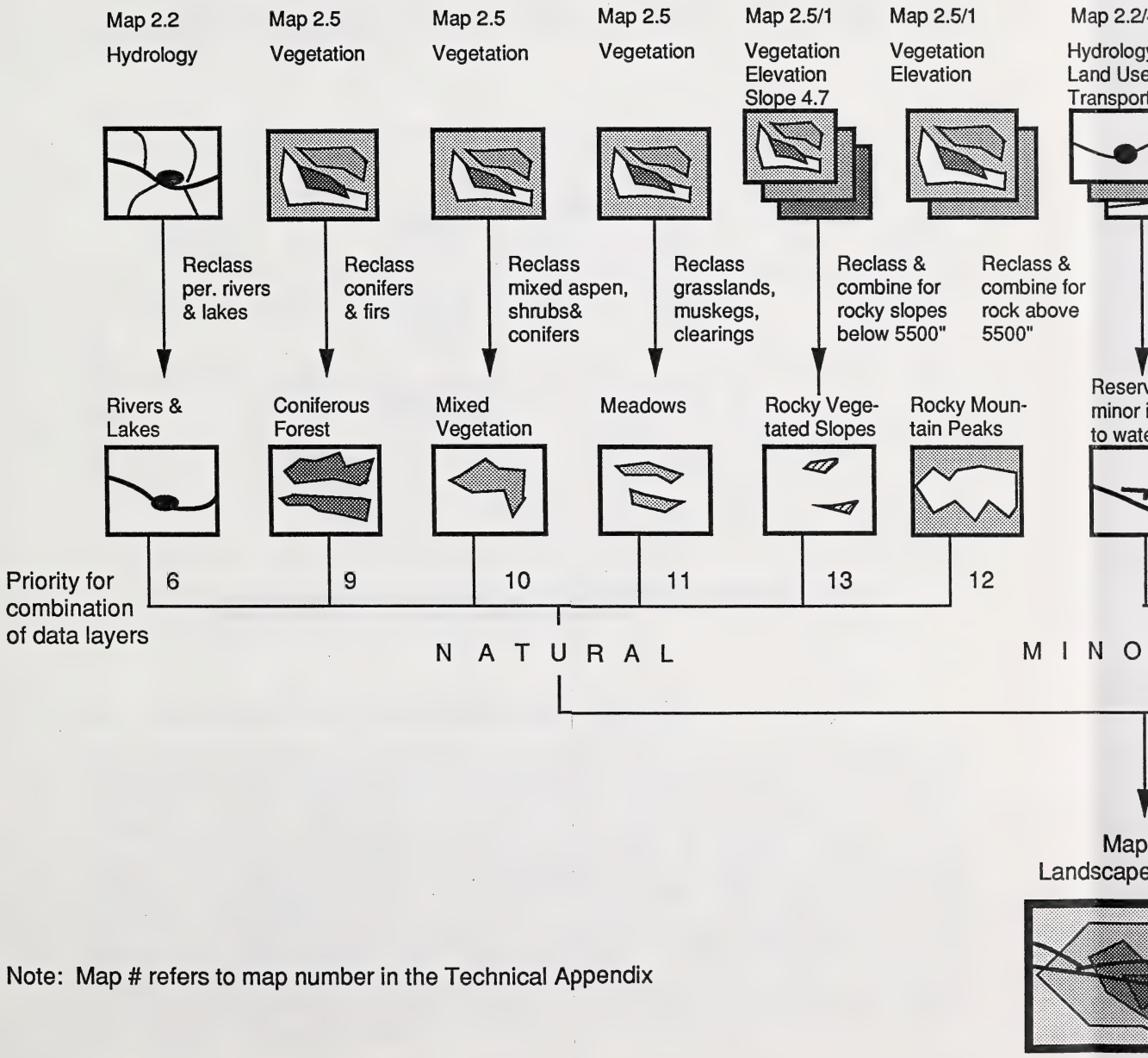
NATURAL
- Rivers and Lakes
- Coniferous Forest
- Mixed Vegetation
- Meadows
- Rocky Vegetated Slopes
- Rocky Mountain Peaks

MANMADE
- Major Roadways
- Town Core
- Hamlets : Residential
- Highway : Commercial
- Mines : Industrial Plants

MINOR IMPACTS
- Reservoirs and minor impacts• to water
- Vegetated areas with minor impacts•

• Minor impacts; utility corridors, small roads, recreation areas

Data Flowchart for La



Note: Map # refers to map number in the Technical Appendix

or Landscape Character Map

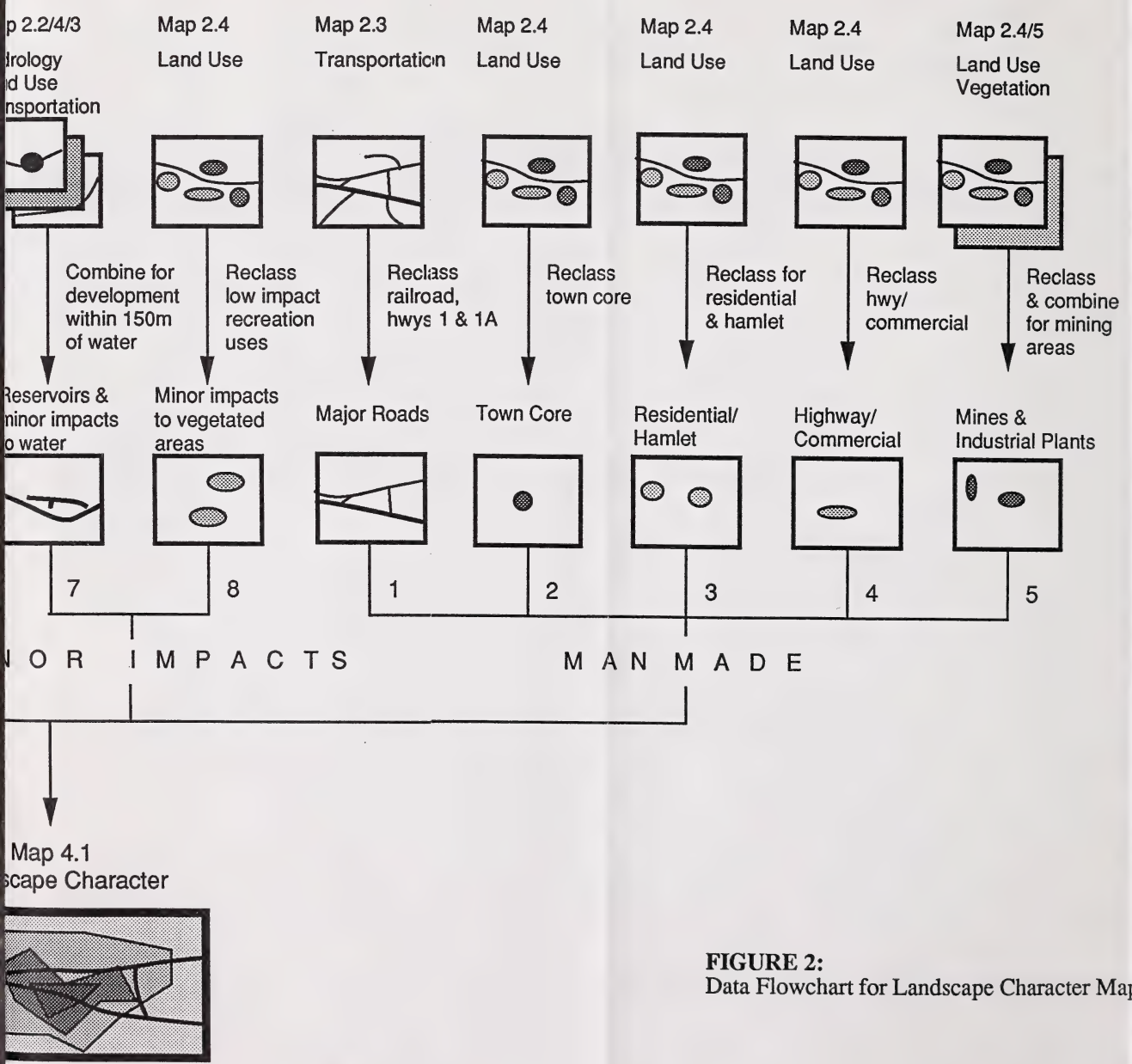


FIGURE 2:
Data Flowchart for Landscape Character Map

"explicit" terminology is favoured as it helps to limit subjectivity in the interpretation of "softer" terminology. It may also tend to provide more "pure" responses to questions involving subjective evaluation such as those that were asked in this exercise.

To achieve consensus in this process of evaluating visual quality, the complete set of 69 slides was shown to the group twice. The resulting visual quality ratings were then used accordingly to group the landscape character types employed in the classification of landscapes within the study area.

These results are illustrated in the following figure (see Figure 3: *Visual Quality Ratings By Landscape Character Type*).

FIGURE 3:
Visual Quality Ratings by Landscape Character Type

	Visual Quality						
	Very Beautiful to Beautiful	Beautiful	Beautiful to Moderate	Moderate	Moderate to Ugly	Ugly	Ugly to Very Ugly
Landscape Character Types	Rocky Mountain* Peaks	Coniferous Slopes	Reservoirs and** Minor Impacts to Water	Major Roads	Rocky Vegetated Slopes	----	Mines/Industrial Plants
	Rivers & Lakes	Mixed Vegetation	Vegetated areas** with Minor Impacts		Town/Core		
		Meadows			Hamlets/ Residential		
					Highway Commercial		

* Rocky Mountain peaks were identified as "very beautiful to beautiful" by the Public Group in the cognitive mapping exercise.
** Minor impacts include utility corridors, small roads and low impact recreation areas.

2.2.3 Comparison of Public Group's Evaluations with Others

Two other groups outside of the public group, undertook the exercise in which the visual quality of the Bow-Canmore valley was evaluated. The second group was the project Steering Committee, most of whom resided either in the City of Edmonton or the City of Calgary in Alberta. The third group consisted of Landscape Architects from Colorado, U.S.A. Generally the results from all three groups were very similar. However, in the evaluation of the manmade landscape, especially the category "Mines/Industrial Plants", the rating was less negative from one group to the next. The local group rated "Mines/Industrial Plants" as "Ugly to Very Ugly"; the Steering Committee rated these "Ugly" and the Colorado group rated them "Moderate". From these results, it would appear that people who are less familiar with the area do not find the manmade landscapes as unattractive as do people who are more familiar with the area. The subject of visitor perception of visual quality in relation to residents' perception of visual quality is a relatively new area of study.

2.2.4 Visual Character Concept

In order to develop some concept of the visual character that is perceived to exist within the study area, each member of the public group was asked; "*What is the view or visual image that most represents your idea of what the visual character of the Bow-Canmore area*
a. *is*; and
b. *should be*."

The following is a summary of a number of the responses that were given:

a. *What is the view or visual image that most represents your idea of what the visual character of the Bow-Canmore area is?*

- "It is an area of great beauty as a result of existing natural features, especially the mountains and rivers."
- "There are some ugly developed areas, particularly mining scars."
- "Some of the small town development is acceptable."
- "Various features, which add to the area's special quality include: uniqueness, wilderness, seasonality, scale and types of views."
- "It is the entry to the Rockies and a recreational/tourist area."

b. *What is the view or visual image that most represents your idea of what the visual character of the Bow-Canmore area should be?*

- "Preserve the existing beautiful character of the area."
- "New development should be harmonious with nature."
- "Ugly areas should be improved."
- "Guidelines for development are needed (and implementation)."
- "Value judgments included 'no glitz, not expensive'."

These responses inspired several initial thoughts regarding the perception of visual character within the study area. Through the development of these thoughts, a concept of appropriate visual change for the future in the Bow-Canmore valley evolved: that being "change to sustain natural beauty".

2.2.5 Relationship Between Visual Quality and Visual Quality Objectives

"Visual Quality Objectives" is a term typically used in visual studies, for example in many of those undertaken by the United States Bureau of Land Management (BLM) and by both the United States and Alberta Forestry Services. Visual Quality Objectives are defined by Alberta Forestry, Lands and Wildlife (1988) as follows:

> A desired level of excellence based on scenic qualities of an area. Refers to degree of acceptable alteration of the visually characteristic landscape.

The Visual Quality Objectives employed in this study are described below:

- "Full Protection" - provides for ecological change only.
- "Partial Protection" - human interaction should be unobtrusive to residents or visitors and should not detract from the natural scenic quality.
- "Modification and Improvement" - human activity may dominate the characteristic landscape, but should use naturally established form, line, colour and texture. It should appear close to a natural occurrence when viewed in the foreground. In addition, existing conditions should be enhanced in scenic value and quality.
- "Improvement" - existing conditions should be enhanced in scenic value and quality.

The public group identified the relationship between visual quality and Visual Quality Objectives in the first work session (see *Appendix III*, p. 59). Each smaller group of four to five members completed a table similar to that found in Figure 4: *Visual Quality Objectives in Relation to Rating of Visual Quality*. The groups' results are summarized in Figure 4.

FIGURE 4:
Visual Quality Objectives in Relation to Rating of Visual Quality

	Visual Quality Objectives			
Visual Quality	Full Protection	Partial Protection	Modification & Improvement	Improvement
VERY BEAUTIFUL				
BEAUTIFUL				
MODERATE				
UGLY				
VERY UGLY				

The relationship between the visual quality ratings and the visual quality objectives is illustrated in Figure 5.

2.2.6 Creation of Visual Quality Objectives Map

The results of the rating of visual quality and the relationship between this and Visual Quality Objectives (see Figure 4 above) were applied to the computer generated Map 2: *Landscape Character*. This was reclassified to create Map 3: *Visual Quality* which identifies areas from most attractive ("most beautiful") to least attractive ("most ugly"). This map in turn was reclassified to produce Map 4: *Visual Quality Objectives* based on the above table. Refer also to the *Appendix*, Figures 1 and 2, for data flowcharts of the processes employed. These illustrate how the categories in one map were reorganized to create a new map. The "reorganization" of categories in a map is also described as "reclassification" or "recoding".

FIGURE 5:
Visual Quality Objectives and Visual Quality in Relation to Landscape Character Types

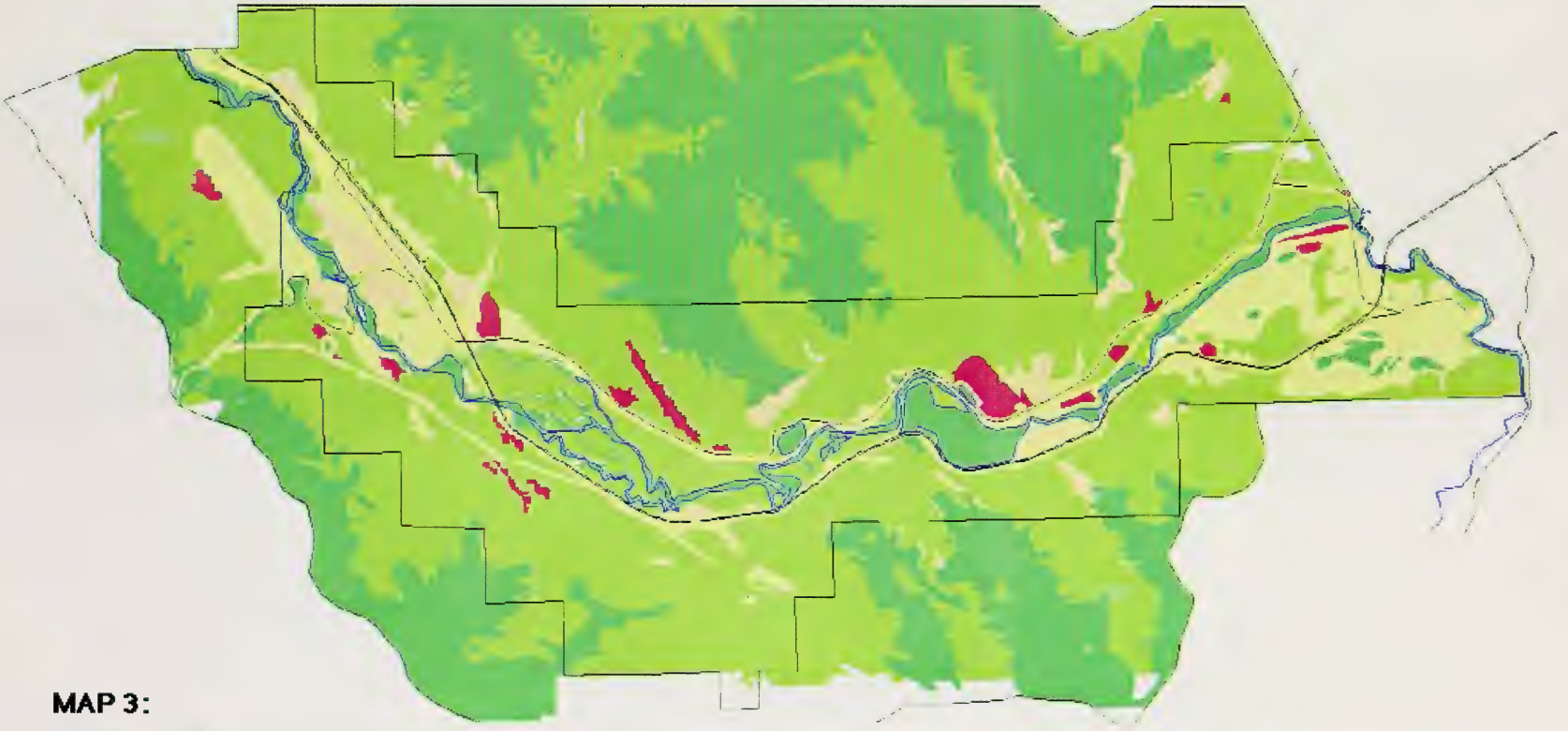
	Visual Quality Objectives and Visual Quality			
	FULL PROTECTION Very Beautiful to Beautiful	PARTIAL PROTECTION Beautiful, Beautiful to Moderate	MODIFICATION & IMPROVEMENT Moderate, Moderate to Ugly	IMPROVEMENT Ugly, Ugly to Very Ugly
Landscape Character Types	Rocky Mountain Peaks	Coniferous Slopes	Major Roads	Mines/Industrial Plants
	Rivers and Lakes	Mixed Vegetation	Rocky Vegetated Slopes	
		Meadows	Town Core	
		Reservoirs and Minor Impacts to Water*	Hamlets/Residential	
		Vegetated Areas with Minor Impacts*	Highway Commercial	

* Minor impacts include utility corridors, small roads and low impact recreation areas.

Map 4: *Visual Quality Objectives* classifies the landscape in terms of appropriate levels of change, from "Full Protection" and "Partial Protection" to "Modification and Improvement," and "Improvement". The potential for manmade intervention exists in the latter three categories. This ranges from very sensitive low impact development in "Partial Protection" areas, to quality development and redevelopment in "Modification and Improvement" areas and finally to rehabilitation of "Improvement" areas. The second series of Delphi exercises established more detailed descriptions of each of these categories.

2.2.7 Mapping of Important Viewpoints

Important viewpoints were assumed within this study to be either *representative viewpoints* (i.e. viewpoints from which views that are most representative of the local landscape are seen) or *key viewpoints* (i.e. viewpoints from which significant views are seen). Important viewpoints were identified for two reasons. Firstly, representative viewpoints were needed for the selection of representative views of the area's landscape. Photographic images of these views would later be altered by computer to illustrate various scenarios of development and thus, several possibilities regarding future landscape change. Secondly, overall key viewpoints were needed in order to assist in identifying the level of importance that should be ascribed to those areas that are seen and those that are unseen.



MAP 3:

VISUAL QUALITY

Bow Canmore Visual Impact Assessment

Alberta, Canada

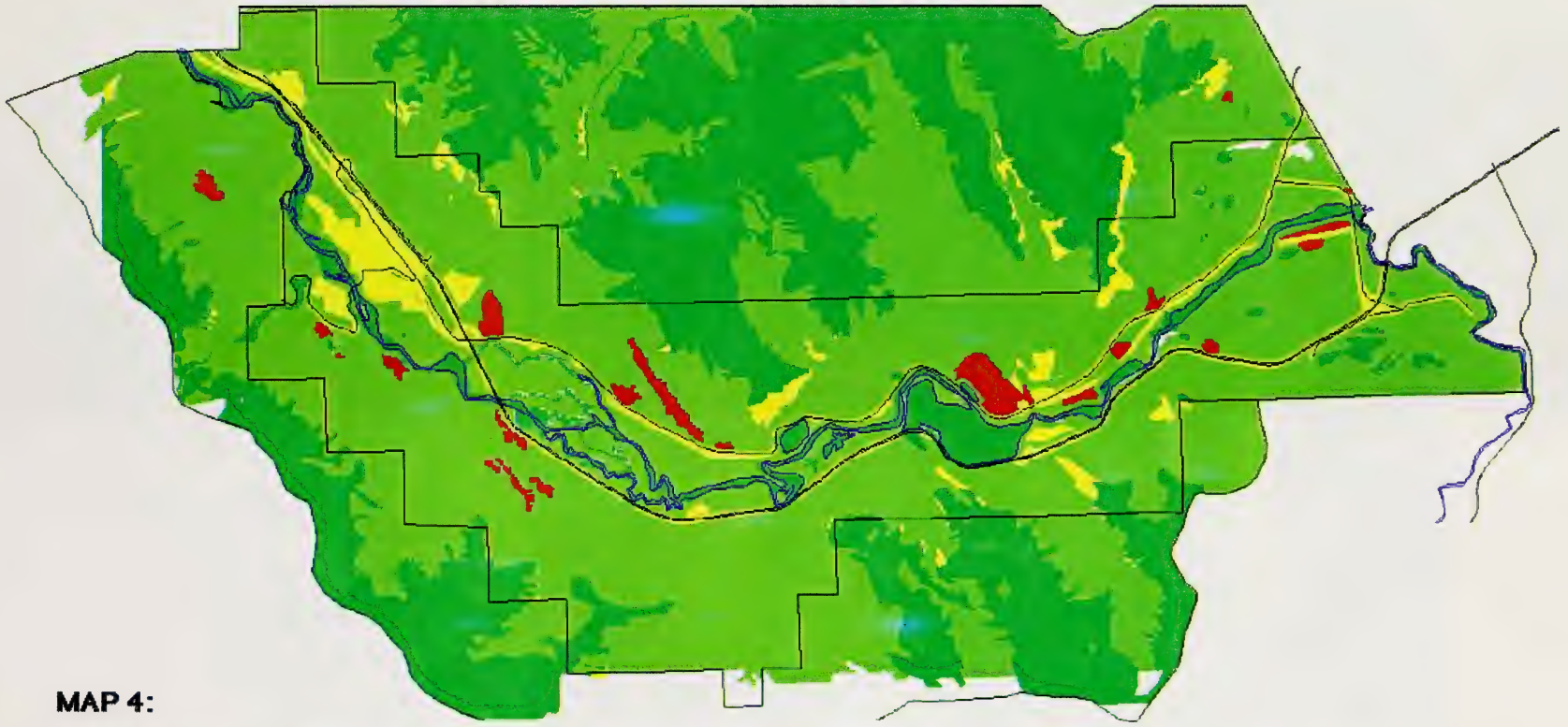
Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km



MAP 4:

VISUAL QUALITY OBJECTIVES

Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

- Full Protection
- Partial Protection
- Modification and Improvement
- Improvement

Two different methods were used to actually determine important viewpoints. The first method, described earlier, involved a cognitive mapping exercise undertaken by the public group at the first session in which they met. At this session, the group was asked to locate, on a 1:50,000 scale topographic map of the study area, all of the viewpoints that each of them considered to be important. These locations were combined on a single composite map of the area which summarized all of the important viewpoints as determined by the group. Of these, eighteen important viewpoints stood out as being identified most often by the group.

The second method used to determine important viewpoints involved the application of the Delphi process. This process, also described earlier, was used as an alternative means of achieving consensus in the identification of important viewpoints within the study area. Through an iterative review by the group of the 69 slides of the area that had been shown to them earlier in their evaluation of visual quality (see Section 2.2.2: *Rating of Visual Quality*), twelve important viewpoints were selected by each individual in the group.

The identification of the *most important views* within the study area followed from this determination of important viewpoints. Eight views were interpreted as being the most important overall when the results of the two methods described above were considered together. These eight views are described below (see Figure 6: *Eight Most Important Views-Table*).

FIGURE 6:
Eight Most Important Views-Table

Photo #		Visual Quality Rating	# Votes
27	(Mountain reflection in river)	Very Beautiful	17
3	(Coniferous forests and mountains)	Very Beautiful	15
6	(Grassi lakes)	Very Beautiful	11
4	(Yamnuska)	Beautiful	10
44	(Canmore Main Street)	Moderate to Ugly	10
5	(Industrial Plant at Lac des Arcs)	Very Ugly	7
48	(Lac des Arcs with windsurfer)	Beautiful	6
61	(Overview of Canmore environs)	Beautiful to Moderate	5

Figure 7: *Eight Most Important Views-Photographs* shows examples of views which represent existing landscape character types and their visual quality ratings. The conclusions of the public group were that natural landscapes are the most beautiful, especially those with rocky mountain peaks or water included in the scene. The less attractive landscapes are those with manmade development ranging from roadside strip development to mining or industrial uses. In fact, mining and industrial uses were considered by the group to be the most unattractive landscape features within the study area.

2.3 Determination of Acceptable Levels of Modification and Importance of Viewsheds

Once the basic parameters of Visual Quality Objectives such as "Partial Protection" or "Improvement" were established, it was necessary to determine more precise levels of acceptable landscape change.

2.3.1 Development of Modified Scenarios

Computer technology was used to modify the images within photographs of several views throughout the study area. The intention was to create scenarios of possible development within the valley and provide images that would look as realistic as possible. These photographic images could then be presented to the public group for their evaluation as to whether or not the scenario represented an acceptable level of landscape change.

Eleven of the top twelve important viewpoints selected in the Delphi process (see above Section 2.2.7: *Mapping of Important Viewpoints*) were selected for computer modification. This selection of only eleven was based on the need to represent all of the "developable" landscape character types within the study area. Those landscape character types represented by the Visual Quality Objective of "Full Protection" (i.e. rocky mountain peaks and rivers and lakes) were not included.

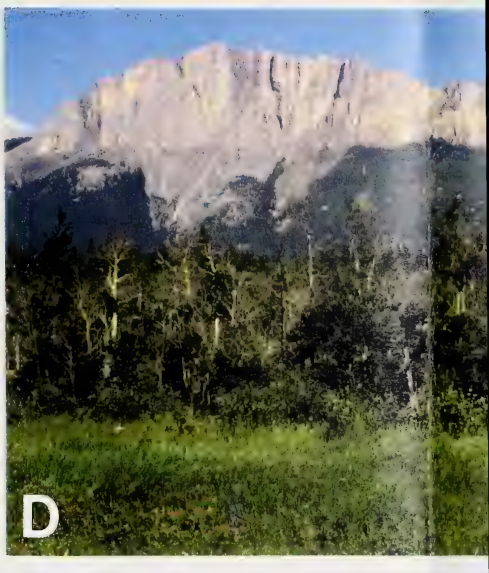
Proposed development envelopes were first mapped on two-dimensional maps and then modelled, on the computer, in three-dimensional views using the same viewpoints from which the original photographs of each of these views had been taken. The three-dimensional models were then superimposed on photographs that had been processed by the computer. In order to enhance these images and improve their realistic appearance, PC based "paint" functions were used, in this case software products called *Lumena* and *Tips*. In some instances, where photographic images contained sufficient references to determine scale and dimension, it was not necessary to model views in three dimensions.

In the above described manner, photographs from each of the eleven viewpoints were modified to create a minimum of three different possible development scenarios. Figures 8, 9 and 10 (following) illustrate computer simulated views of possible development from three different viewpoint locations in the valley. All of the computer simulated views from each of the eleven viewpoints are illustrated within the *Bow-Canmore Visual Impact Assessment-Technical Appendix.*

2.3.2 Rating of Acceptable Levels of Landscape Change

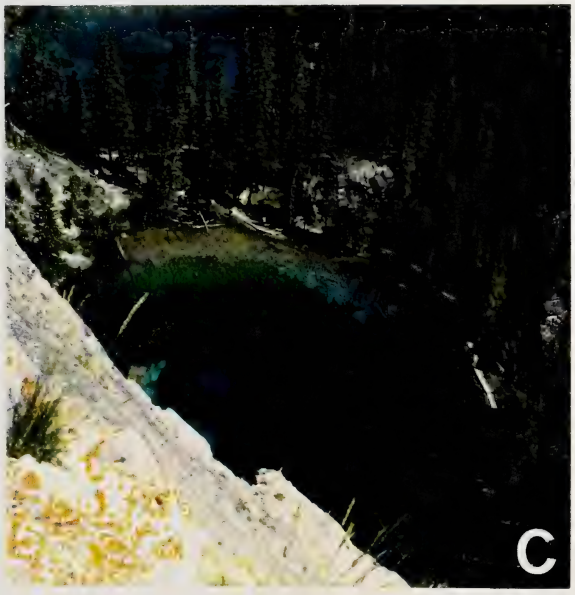
A second session involving the local public group took place approximately six weeks after the first session. At this second session, the first exercise involved the comparative evaluation, by the group, of simulated versus actual, unmodified views. A minimum of three different modified photographs of each of the eleven viewpoints considered *important*, were shown to the group in a slide presentation. For each view, the group was also shown one unmodified photographic slide as well. The group was asked to compare each view of a modified landscape to the actual landscape and rate each slide on a scale as follows: "very best", "much better", "better", "same", "worse", "much worse", "very worst". Once again, the Delphi process was employed to achieve a consensus among the group with respect to each of the modified views they were shown (see Figures 8, 9 and 10: *Computer Simulated Views*).

A

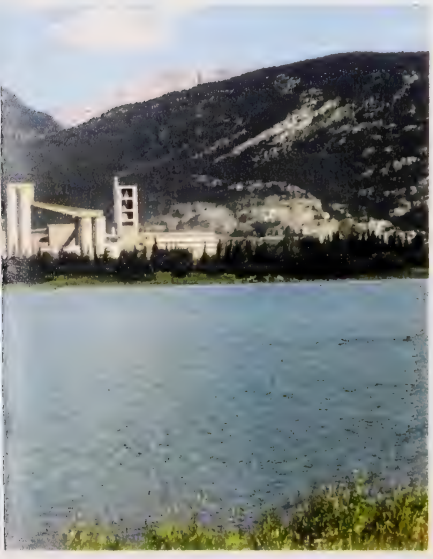

D

B

E

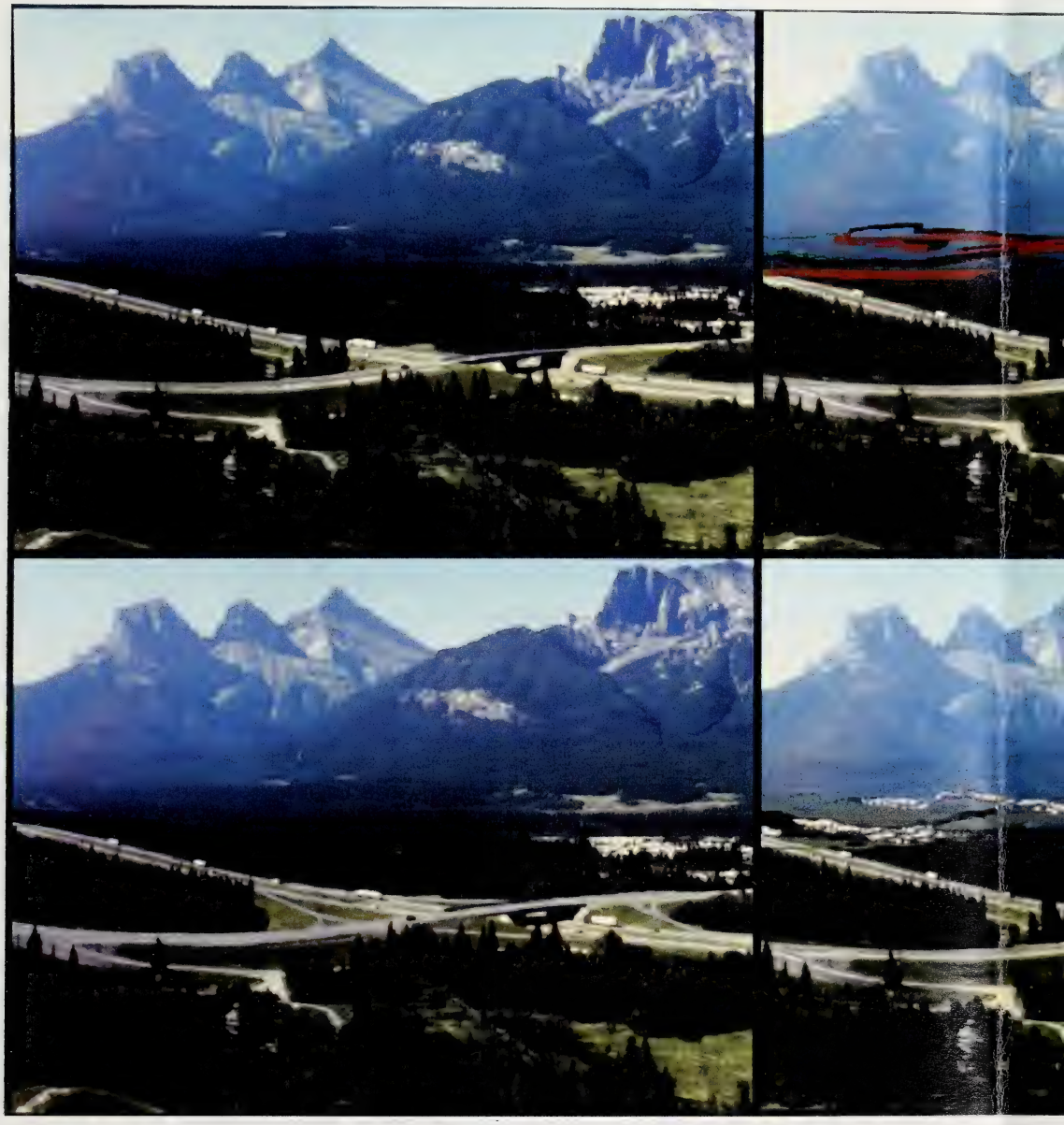

C

F



View #	Visual Quality Rating	Landscape Character Type
A (27)	Very Beautiful	Rivers and Lakes
B (3)	Very Beautiful	Coniferous Forests
C (6)	Very Beautiful	Rivers and Lakes
D (4)	Beautiful	Mixed Vegetation
E (44)	Moderate to Ugly	Town Core
F (5)	Ugly	Mines/Industrial
G (48)	Beautiful	Rivers and Lakes
H (61)	Beautiful to Moderate	Minor Impacts to Water

FIGURE 7:
Eight Most Important Views - Photographs



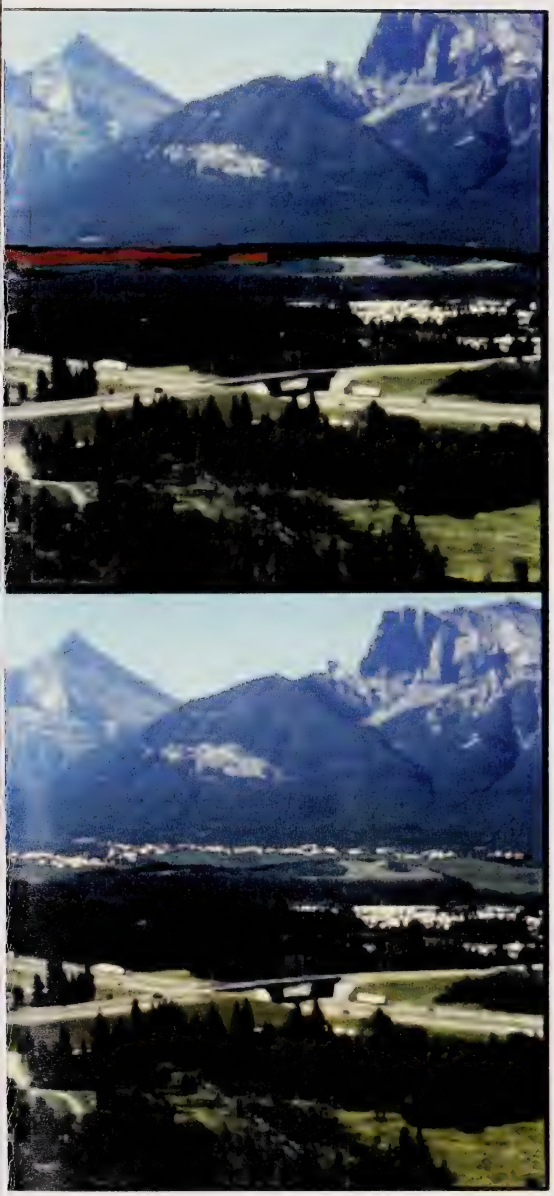


FIGURE 8:
Computer Simulated Views from Viewpoint #20

Upper Left: Existing Conditions
(Beautiful to Moderate)

Upper Right: Computer model of proposed development area superimposed on existing conditions
(no rating)

Lower Left: Expanded interchange
(Same to a Little Worse)

Lower Right: Golf Course and Residential Development
(Generally Worse, although ranged from Better to Very Worst)

Note: Description in brackets refers to public group visual quality ratings in relation to existing conditions.

FIGURE 9:
Computer Simulated Views from Viewpoint #42

Upper Left: Existing Conditions
(Moderate)

Upper Right: Foreground Roadside Strip Development
(Worse to Much Worse)

Lower Left: Middle to Background Low Rise Residential Development
(Same to Much Worse)

Lower Right: Combination of Foreground Roadside Strip Development and Middle to Background Low Rise Residential Development
(Worse to Very Worst)

Note: Description in brackets refers to public group visual quality ratings in relation to existing conditions.

FIGURE 10:
Computer Simulated Views from Viewpoint #5

Upper Left: Existing Conditions
(Ugly)

Upper Right: Camouflage Paint Scheme for the Industrial Plant
(Worse)

Lower Left: Grey Paint Scheme for the Industrial Plant
(Same)

Lower Right: Mine and Industrial Plant removed and the landscape reclaimed to natural conditions
(Very Best).

Note: Description in brackets refers to public group visual quality ratings in relation to existing conditions.

As a check and reference to the results of this comparative rating of acceptable levels of landscape change, a *summary visual quality evaluation* was also undertaken by the group during this session. In this exercise, the group was asked to evaluate the visual quality of a combination of twenty-two natural and modified images organized randomly in a separate slide presentation. Once again, the rating scheme that was used ranged from "most beautiful" to "most ugly".

The analysis of the combined results of the *Rating of Acceptable Levels of Landscape Change* are summarized below:

1. Foreground development has considerably more impact than more distant middle or background development. Foreground distance was considered here to be any distance within one kilometre.

2. Golf course development received a wide range of responses from "much better" to "much worse". More people in the group perceived this as a positive visual feature when the clearing patterns appeared natural and the grass green patches provided increased diversity on the forested slopes.

3. The removal of minor manmade impacts such as fences or trails was considered to be only a minor improvement to existing conditions, while the development of roads, etc. in natural areas was rated "worse" or "much worse". The widening of an existing highway interchange was rated "same".

4. Within the Town of Canmore, tree planting along streets and attractive lamp post designs were perceived as visual improvements. Strip roadside development rated "worse", "much worse" or "very worst" throughout. Pedestrianisation of part of the main street was also recommended.

5. Reclaimed and revegetated mining scars scored significantly higher than the existing mining conditions in terms of visual quality. Computer generated paint schemes for the industrial plant were evaluated. Only the scheme which mimicked the lines and colours of the surrounding landscape showed an improvement in rating. It appeared that other schemes were unsuccessful because they evoked military connotations or simulated overly artificial conditions. The scene of restored natural conditions was rated "beautiful".

2.3.3 Viewshed Analysis and Importance of Viewsheds

"Viewshed" is defined by Alberta Forestry, Lands and Wildlife (1988) as being:

> The visible area, as it appears from one or more viewpoints.

Figure 11: *Diagram Illustrating "Viewshed"* graphically shows the meaning of the word.

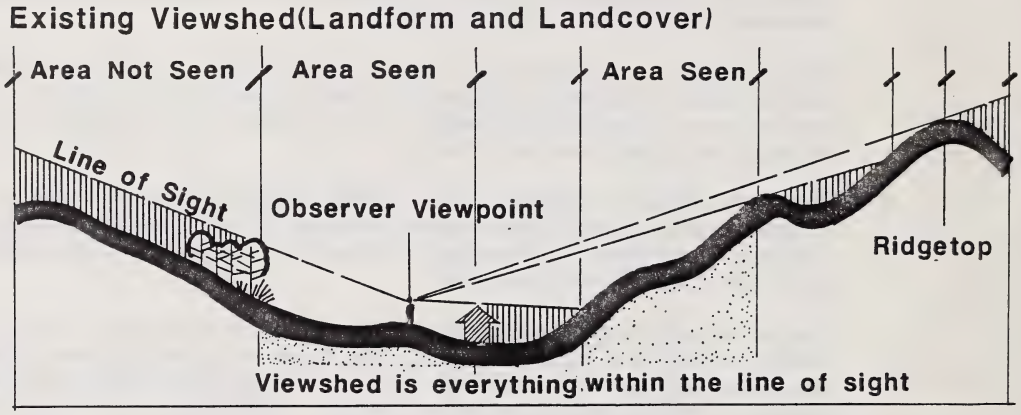
In order to determine the most important viewsheds within the study area, the three types of important views and their viewpoints, as described in Section 2.2.7, were analyzed. These included:

1. The eight most important views selected by the group (see Map 5: *Viewpoint Locations for Viewshed Generation*);

2. Views from major highways - Highways 1 and 1A (important because of the extent of their use). These views are from eight or nine evenly spaced points along each highway in order to best represent generalized views from both highways (see Map 5: *Viewpoint Locations for Viewshed Generation*); and

3. Views from areas of scenic significance based on ecological, recreational or historic/cultural value. These areas were identified in previous studies, in particular the "Environmentally Significant Areas of the Calgary Area" and the "Canmore Corridor Study, Volumes I and II". (See *Appendix*, Map 3: *Areas of Scenic Significance*).

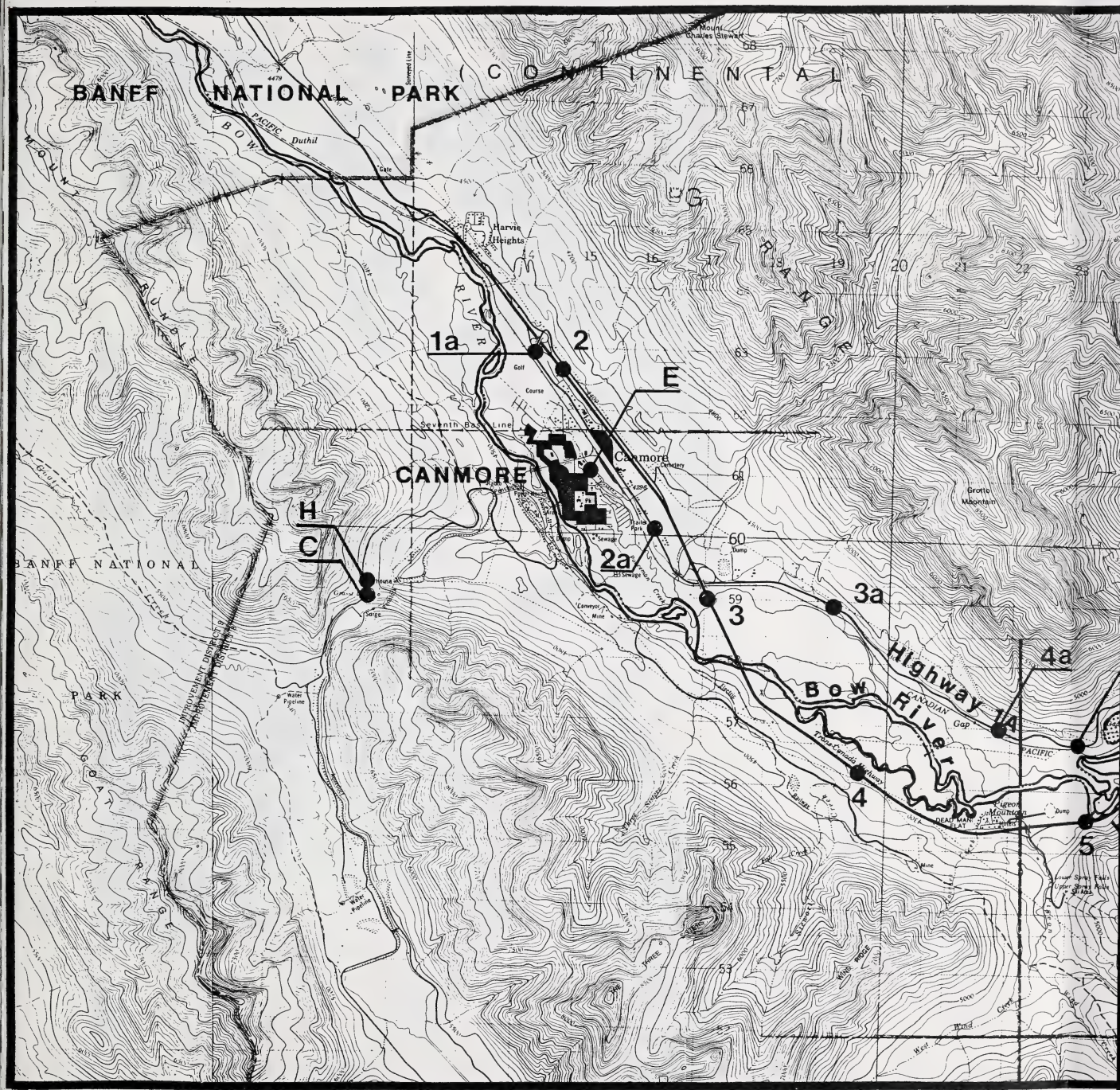
FIGURE 11:
Diagram Illustrating "Viewshed"



Employing a GRASS based GIS process, viewsheds were generated from the eight viewpoints and from the selected evenly spaced points along Highways 1 and 1A. The process of generating viewsheds from individual points and then combining all of them to show which areas are most frequently seen (or conversely, unseen), is explained in the data flowcharts (see *Technical Appendix*, Diagrams 5.3 and 5.4).

Viewsheds are generated by identifying the area which can be seen from the viewpoint. By combining the eight viewsheds from the eight important viewpoints, the map, *Frequency of Areas Seen from Eight Most Important Viewpoints* (see *Appendix*, Map 2) was generated. This map indicates how frequently the areas are seen.

As there are eight viewpoints, the area may be seen as many as eight times. However, the most any area is seen in this map is six times. Similarly a combination of the viewsheds from the evenly spaced viewpoints along the highways were combined to indicate the area seen from the highways. The areas that are black or empty on these maps are the areas that are unseen or not seen from any of the combination of viewpoints. These unseen areas are illustrated on Map 6: *Unseen Areas from Highways 1, 1A and Eight Most Important Viewpoints.*



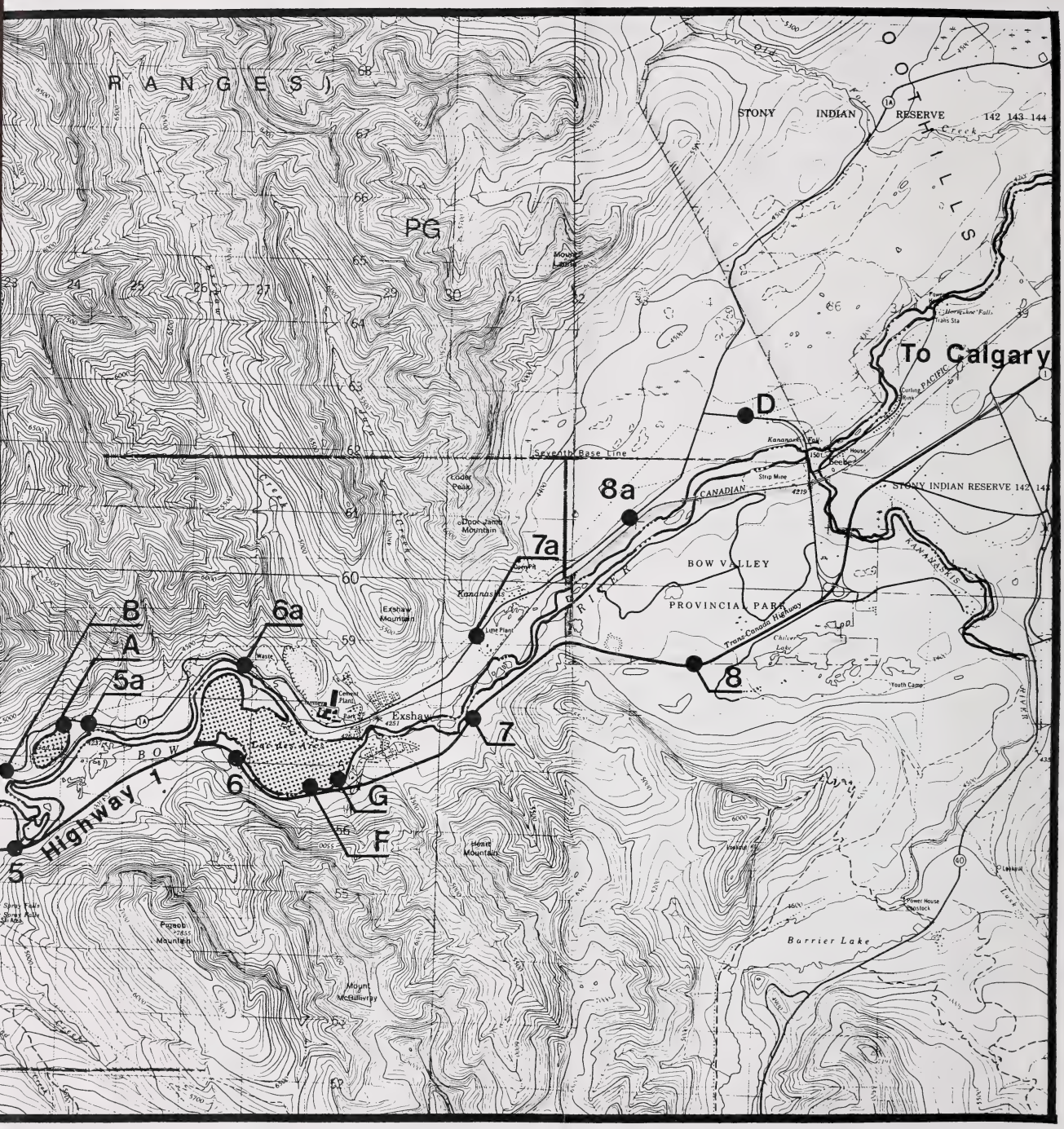
MAP 5: VIEWPOINT LOCATIONS FOR VIEWSHED GENERATIO

Bow-Canmore Visual Impact Assessment

Alberta, Canada

Prepared for:
Alberta Tourism

Prepared by:
Landplan Associates, Ltd. and Design Workshop, Inc.

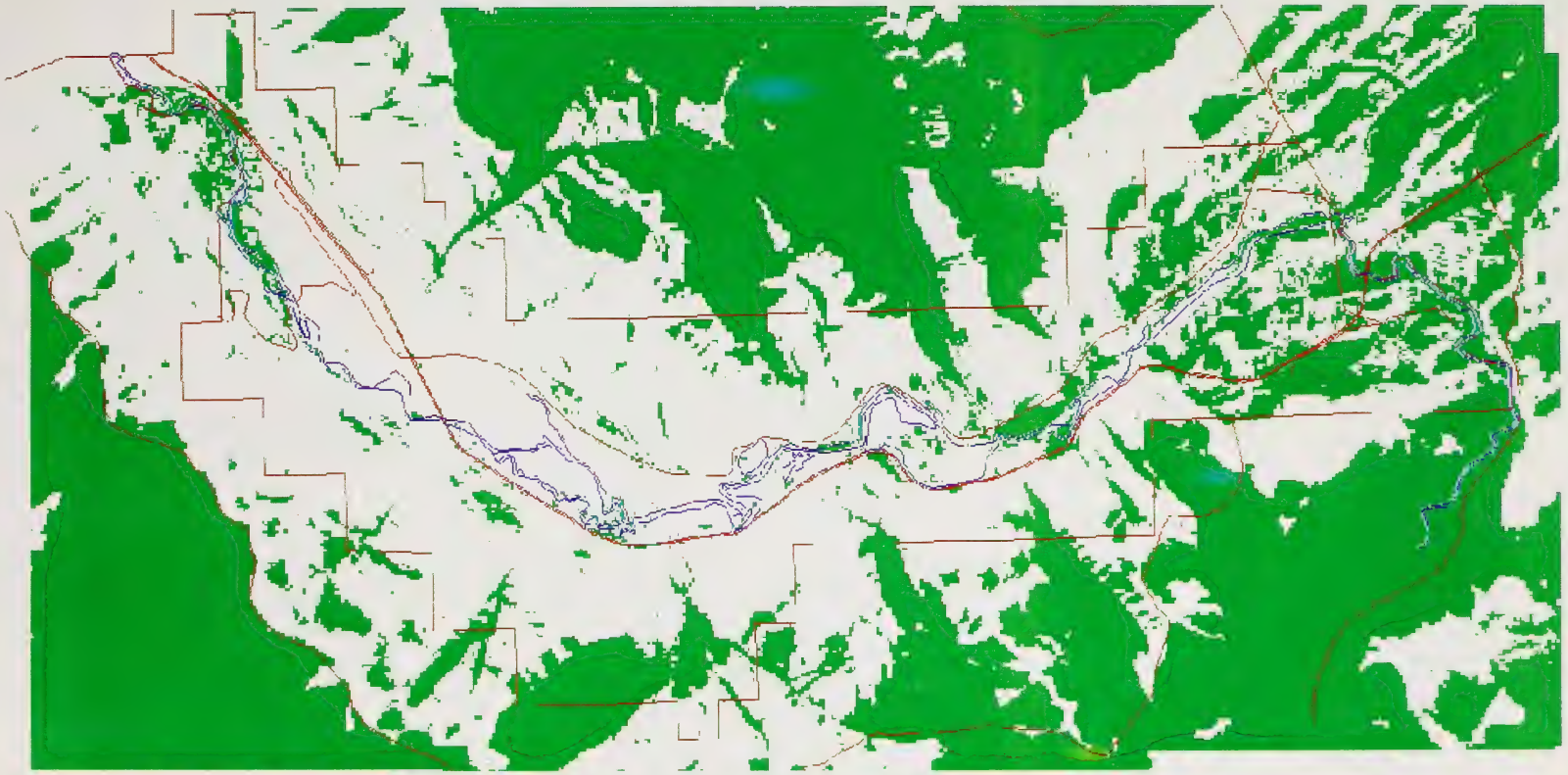


TION

● E 8 Most Important Viewpoint Locations

● 6 Viewpoint Locations on Hwys 1 &1A

North 0km 1.6km 3.2km



MAP 6:
UNSEEN AREAS FROM HIGHWAYS 1, 1A AND 8 MOST IMPORTANT VIEWPOINTS
Bow Canmore Visual Impact Assessment
Alberta, Canada

Unseen Areas

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

When the public group was asked to identify objectives in unseen areas relative to the Visual Quality Objectives previously established, their responses indicated that areas which are unseen from a combination of important viewpoints may be less sensitive in terms of their development (see *Appendix*, Map 4: *Comparison of Visual Quality Objectives in Unseen Areas from Highways 1, 1A* and *Eight Most Important Views*). Conversely, it appeared that areas which are most seen should be afforded additional visual protection or improvement.

3. DEVELOPMENT OF GUIDELINES AND IMPLEMENTATION STRATEGIES

The highest visual quality within the Bow-Canmore valley is attributed to the natural scenery; or in other words, to the areas least touched by man. The rocky mountain peaks, rivers and lakes are considered to be the most beautiful landscape features, followed by coniferous forests, mixed vegetated areas and meadows. Minor manmade impacts such as fences, trails and poles do not seriously detract from the natural beauty, however more intense developments, such as roads and buildings, are considered to be unattractive. Industrial activity and mining are considered to be the least attractive of all of the features within the landscapes of the study area.

Therefore, based on the input of the public group and the findings of this study, the visual concept for future land use in the Bow-Canmore valley is "change to sustain natural beauty". As illustrated in Map 4: *Visual Quality Objectives*, "Full Protection" should be given to rocky mountain tops, rivers and lakes. "Partial Protection" is recommended for coniferous forests, mixed vegetated areas, meadows, reservoirs and minor impacts to water and to vegetated areas. "Modification and Improvement" should be considered for major roads, towns, hamlets and highway commercial development. "Improvement" is recommended for mines and industrial plants.

To sustain the visual quality of the Bow-Canmore area, the following general concepts should be duly considered.

- The Visual Quality Objectives of the *Bow-Canmore Visual Impact Assessment-Report* should be followed.
- Natural features such as riparian areas, the benchlands and the hoodoos should be protected.
- Elements within the valley's less attractive landscape character types such as major roadways, highway commercial development and mining sites should be improved.
- Sites for new development should be located so that "visibility" is minimized.
- New development should be in a form that is visually harmonious with the natural environment.
- The visual quality guidelines described in the *Bow-Canmore Visual Impact Assessment-Design Manual* should be appropriately applied to the built environment throughout the conceptual design, planning and construction phases of development.

3.1 The Design Manual

The *Bow-Canmore Visual Impact Assessment-Design Manual* has been developed to assist planners, administrators and proponents of development in evaluating proposed land use changes relative to visual criteria. This document outlines a step by step process which will result in visually sensitive and appropriate development.

3.2 Comparison of Visual Quality Objectives with Existing Land Use Controls

A comparative analysis was made between Map 4: *Visual Quality Objectives* and a number of other policy maps which described potential conditions for the Bow-Canmore valley. The intent was to identify areas where potential conditions may result in supportive, neutral, conflicting or different visual impact.

"Supportive" visual impact describes a situation where the proposed visual impact of development is the best possible in relation to the Visual Quality Objective for the area of development. For example, where existing policy recommends low development potential in an area which has a Visual Quality Objective of "Partial Protection", the resulting visual impact would be supportive.

"Neutral" visual impact describes a situation where the proposed visual impact of development is not negative, but neither is it equal to the standard recommended by the Visual Quality Objective. For example, a policy of medium impact development in an area which has a Visual Quality Objective of "Improvement" would result in a neutral visual impact. See the *Technical Appendix* for further details of assumptions used in the analysis.

"Partially Conflicting" visual impact describes a situation where the proposed visual impact of development has a mild negative relationship with respect to the Visual Quality Objective for the area of development. For example, low impact development in an area which has a Visual Quality Objective of "Full Protection" would result in a partially conflicting visual impact.

"Conflicting" visual impact describes a situation where the proposed visual impact of development has a negative relationship to the Visual Quality Objective for the area of development. For example, a policy of high impact development in an area with a Visual Quality Objective of "Full Protection" or "Partial Protection" would result in a conflicting visual impact, while a policy of low impact development in this area would result in partially conflicting visual impact.

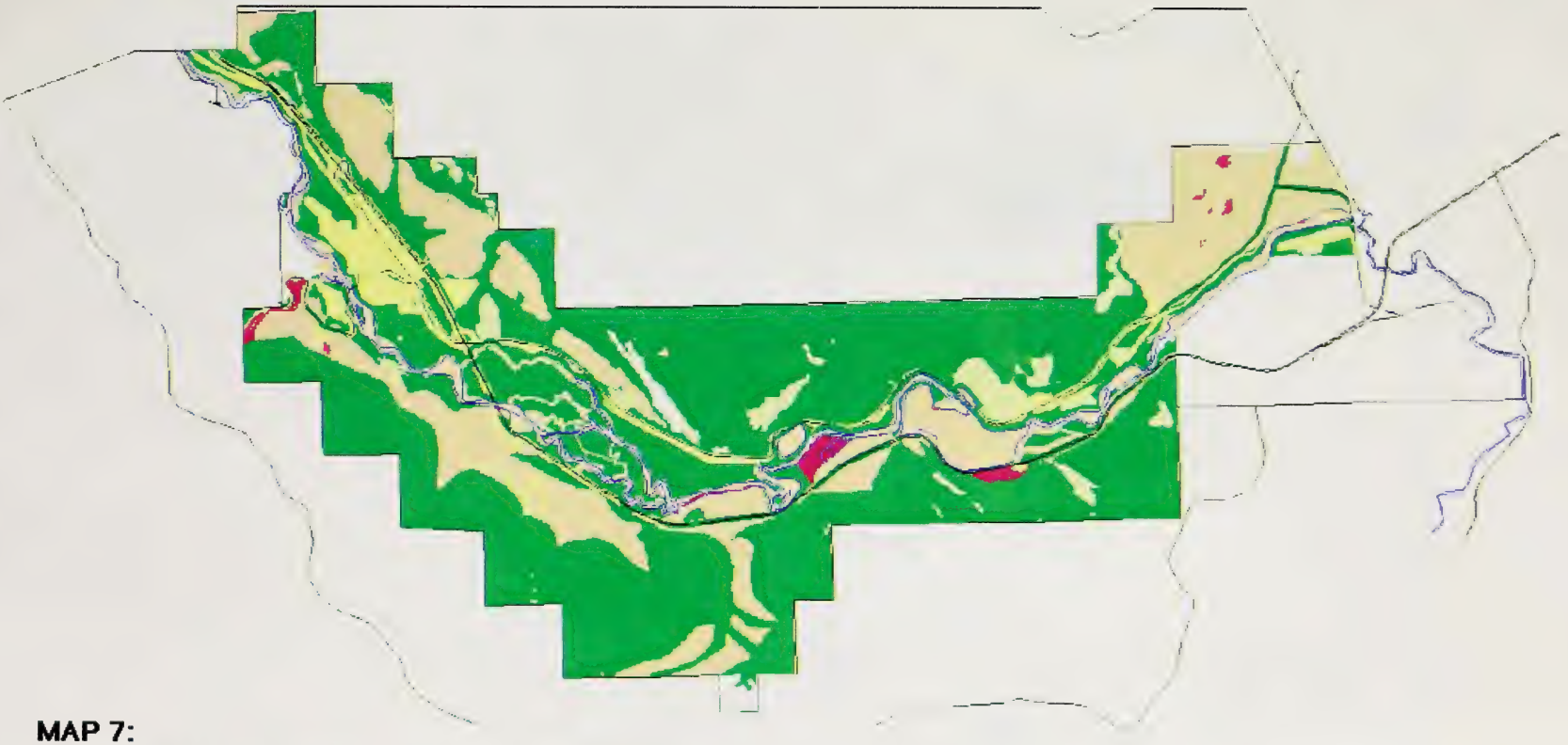
"Different" visual impact describes a situation where the proposed visual impact of development is not relevant in relation to the Visual Quality Objective for the area. For example, the identification of low wildlife potential in an area that has a Visual Quality Objective of "Full Protection" would result in a different visual impact.

A large portion of the supportive visual impact occurs in areas of higher elevation. These areas, however, are largely undevelopable. It is therefore important to pay attention to the areas of conflict which are of a smaller physical size, particularly if they are in important seen areas.

3.2.1 Comparison of Visual Quality Objectives and Land Suitability (See Map 7)

The *Ecology* map (see *Appendix*, Map 5: Ecology), which was based on the "Bow Corridor Local Integrated Resource Plan (IRP) - Ecological Land Classification Ecosite Map" (Alberta Forestry, Lands and Wildlife, 1988), was "reclassified" (a GIS term for creating a new map by reorganizing or regrouping the categories of an existing map) to create a map of *Land Suitability*. This map comprised four categories of suitability for development: "Undevelopable", "Low Development Potential", "Moderate to High Development Potential" and "Gravel/Roadfill". The information for this grouping of categories was contained in the above referenced report. Undevelopable areas were understood to have no development impact potential while the latter two categories would have the highest development impact potential. Development is the opportunity for visual landscape change as a result of manmade intervention. Therefore, high development impact potential is also high visual impact potential.

The results of the comparison of this map with the *Visual Quality Objectives* map show that the two maps are largely supportive with respect to visual impact (see Figure 12).



MAP 7:

COMPARISON OF VISUAL QUALITY OBJECTIVES AND LAND SUITABILITY

Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

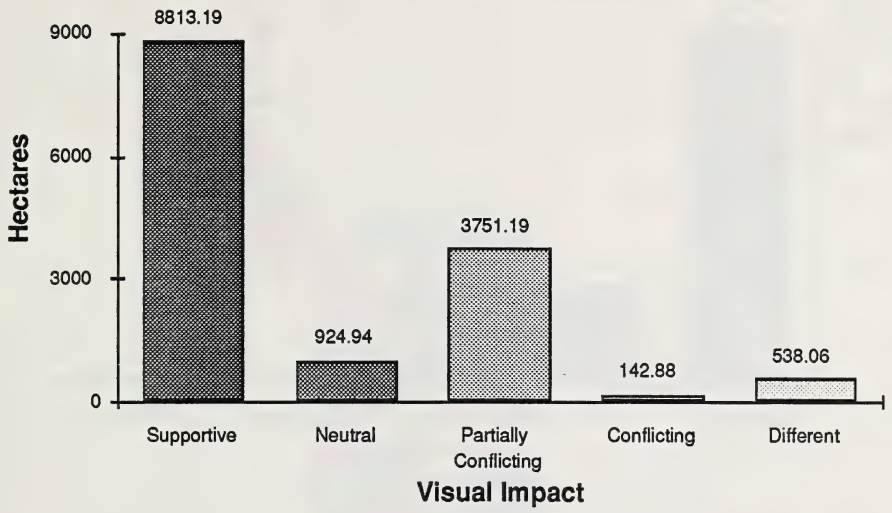
North

0km 1km 2km 3km 4km

VISUAL IMPACT

- Supportive
- Neutral
- Partially Conflicting
- Conflicting
- Different

FIGURE 12:
Visual Impact: Visual Quality Objectives and Land Suitability

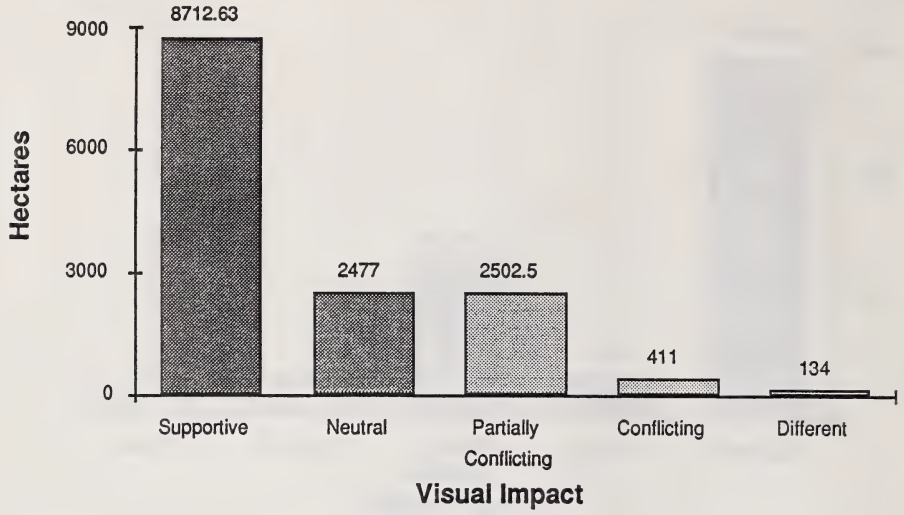


3.2.2 Comparison of Visual Quality Objectives and Wildlife Suitability (See *Appendix*, Map 6)

The previously referenced *Ecology* map was reclassified to create a map of *Wildlife Suitability* which comprised three categories "Low wildlife potential", "Medium wildlife potential" and "High wildlife potential". Again, the information for the grouping of categories was contained in the previously referenced Alberta Forestry, Lands and Wildlife Ecosite Map. The types of wildlife included are: elk, moose, mule deer and sheep. Wildlife potential is based on the land suitability for fall and winter ungulate habitat. Areas of low wildlife potential were understood to be more compatible with "Improvement" than "Protection" while areas of high wildlife potential would be most compatible with "Full Protection".

The results of the comparison of this map with the *Visual Quality Objectives* map show that the two maps are largely supportive with respect to visual impact (see Figure 13).

FIGURE 13:
Visual Impact: Visual Quality Objectives and Wildlife Suitability



3.2.3 Comparison of Visual Quality Objectives and Development Potential (See Map 8)

The *Zoning* map (see *Appendix*, Map 7: *Zoning*) which was based on the "Bow Corridor Local Integrated Resource Plan - Draft Plan" (Alberta Forestry, Lands and Wildlife, 1990), as well as the "Municipal District of Bighorn No. 8, General Municipal Plan" was reclassified to create a map of *Development Potential*. The categories of the *Zoning* map are described in the *Technical Appendix*. The former reference included a list of allowed development in each of its 10 zones. This information was reorganized in three categories: "Low Development Potential", "Medium Development Potential" and "High Development Potential". The first category was understood to have little visual impact potential while the third category would have the highest visual impact potential. It was assumed that privately held lands have higher visual impact potential as there may be possibilities for a wider range of development types on private lands than there may be on public lands, independent of the land's existing zoning.

MAP 8:

COMPARISON OF VISUAL QUALITY OBJECTIVES AND DEVELOPMENT POTENTIAL

Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

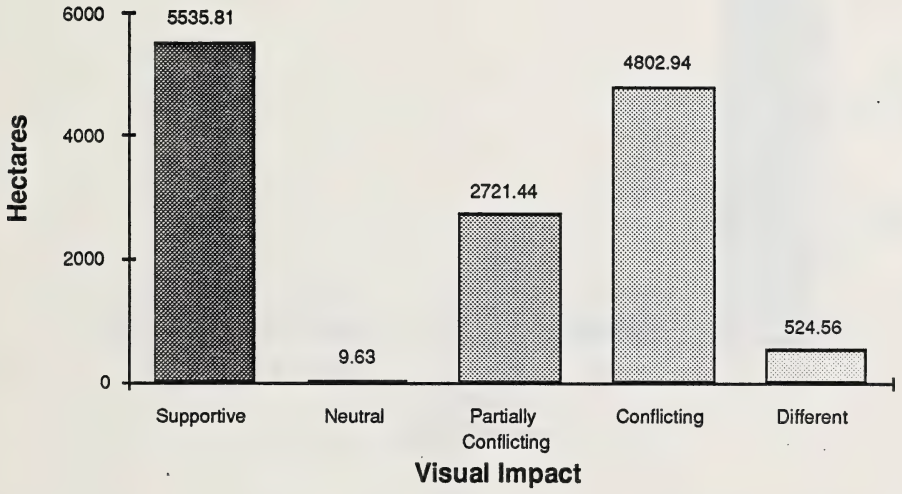
0km 1km 2km 3km 4km

VISUAL IMPACT

- Supportive
- Neutral
- Partially Conflicting
- Conflicting
- Different

The results of the comparison between the *Development Potential* map and the *Visual Quality Objectives* map show that the two maps conflict to some degree with respect to visual impact (see Figure 14 below).

FIGURE 14:
Visual Impact: Visual Quality Objectives and Development Potential

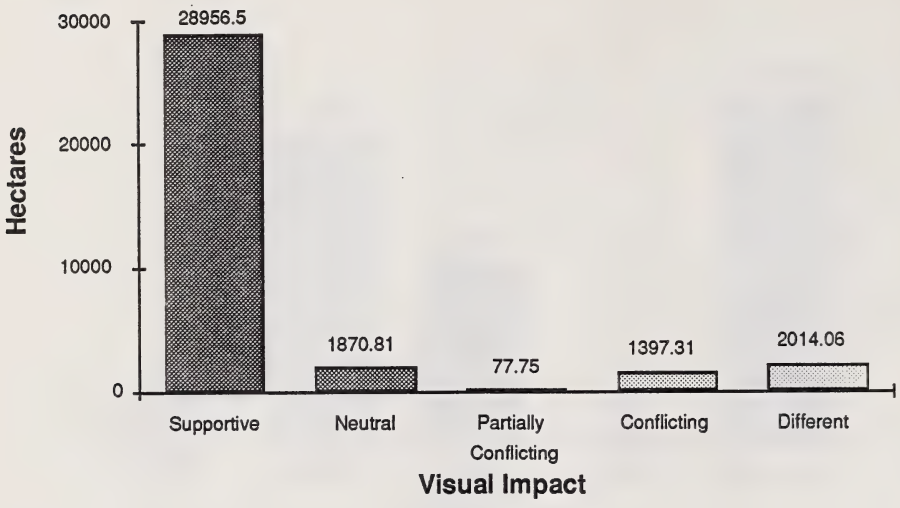


3.2.4 Comparison of Visual Quality Objectives and Potential Development Envelopes (See *Appendix*, Map 8)

The *Potential Development Envelopes* map is based on known proposed development. It comprised four categories: "No development potential", "Golf/Resort", "Recreation/Resort" and "Community Development". Golf/Resort areas were understood to have low development impact potential. This is an assumption which is based on the fairly positive evaluation of golf course visual quality, which also assumes, however, minimal building development in association with the open space. Community Development, on the other hand, would have the highest development impact potential assuming that residential, commercial and industrial development would be predominant within these areas.

The results of the comparison of this map with the *Visual Quality Objectives* map show that based on the above assumptions, the two maps are fairly supportive with respect to visual impact (see Figure 15 below).

FIGURE 15:
Visual Impact: Visual Quality Objectives and Potential Development Envelopes



3.3 Implementation Strategies

The foregoing evaluation, analysis and conclusions provide a foundation upon which local, regional and provincial agencies may build to protect the visual resources of the Bow-Canmore valley. There are many ways in which the Bow-Canmore Visual Impact Assessment may be used during the planning and decision-making phases leading to development. Several of these are outlined below.

1. The Bow-Canmore Visual Impact Assessment should be used as a reference in the recommended review of existing land use controls (ie. zoning) based on the results of the comparison between Development Potential and the Visual Quality Objectives.

2. The *Bow-Canmore Visual Impact Assessment-Design Manual* should be used by proponents, planners and administrators as a reference in:

   a. Reviews of development applications (consideration should be given to include a visual impact assessment wherever it is deemed to be appropriate);
   b. Location of public works based on visual criteria; and
   c. Land acquisition and scenic easements to be based on Visual Quality Objectives and Landscape Character, as well as important viewsheds wherever it is deemed to be appropriate.

3. When an Environmental Impact Assessment is required in the review of any development proposal within the Bow-Canmore valley, a visual impact assessment component should be included. Computer simulation and GIS analysis may become essential tools in this type of assessment.

4. The process employed in the Bow-Canmore Visual Impact Assessment and described in the *Design Manual* and the *Technical Appendix* may be referenced as a model in establishing a methodology for the visual impact assessment component of Environmental Impact Assessments.

5. Public involvement is a key element in the visual review process. A local public group should be established to provide the opportunity for further public involvement in the visual review process. Such a group would also create a non-confrontational forum for discussion among proponents and opponents of development.

GLOSSARY OF TERMS

The following glossary is based primarily on definitions from:

Smardon, Richard C., James F. Palmer and John P. Felleman, Foundations for Visual Project Analysis, John Wiley and Sons: New York, 1986, pages 331 to 332.

and

Alberta Forestry, Lands and Wildlife, 1988. Forest Landscape Management Strategies for Alberta, pages 55 to 56.

Aesthetic(s)

(a) Generally, the study, science or philosophy dealing with beauty and with judgements concerning beauty. (b) Giving visual pleasure. (c) The theory of perception or of perceptibility.

Aesthetic Zoning

Zoning which regulates property in the interest of protecting aesthetic values. (The U.S. Supreme Court, in the 1954 Berman vs. Parker case, upheld this extension of the original legal justification for zoning powers with its finding that "It is within the power of the legislature to determine that the community should be beautiful as well as healthy".)

Adverse Visual Impact

Any impact on the land or water form, vegetation, or any introduction of a structure which adversely changes or interrupts the visual character of the landscape and disrupts the harmony of the natural elements. (U.S. Bureau of Land Management, 1977)

Background

The distant part of a landscape, picture, etc.; surroundings, especially those behind something and providing harmony or contrast; surrounding area or surface. Area located 8 km or greater from the viewer.

Characteristic

That which constitutes a character; that which characterizes; a distinguishing trait, feature, or quality; a peculiarity.

Contrast

Diversity of adjacent parts, as in color, tone, or emotions.

Design

A deliberate plan or scheme to arrange elements so that a desired pattern results.

Detailed Assessment

A relatively intensive reconnaissance of a landscape or parts of a landscape.

Enhancement

A short-term management alternative used to raise the value, desirability or attractiveness of a landscape.

Foreground
The detailed landscape found 1 km or less from the observer.

Full Protection (Preservation)
A Visual Quality Objective that provides for ecological change only without man-made intrusions.

Improvement
A Visual Quality Objective that provides for enhancement in (scenic) value and quality.

Landscape
Land form and land cover forming a distinct pattern; portion of land that the eye can see in one glance.

Landscape Management
The assessment, evaluation, design and manipulation of a landscape.

Landscape Unit (Landscape Character Type)
An area indicating landscape similarity.

Middleground
The space between the foreground and the background in a picture or landscape. The area located from 1 km to 8 km from the viewer.

Mitigation
A method or procedure designed to reduce or lessen the impacts on the environment caused by development (i.e. visual activities).

Modification
A Visual Quality Objective meaning human activity may dominate the characteristic landscape but must, at the same time, use naturally established form, line, color and texture. It should appear close to a natural occurrence when viewed in foreground.

Partial Protection (Retention)
A Visual Quality Objective which aspires to ensure that human intervention is unobtrusive to residents or visitors and does not detract from the natural scenic quality.

Perception
(a) People's impression of an object or space as based on past and/or anticipated experiences. (b) Making oneself aware of all conditions and applicable factors; comprehension.

Rehabilitation
A short-term management alternative which returns existing adverse visual impacts, through modification or elimination, to a desired scenic quality. (U.S. Bureau of Land Management, 1977)

View
A broad landscape or panorama looked toward or kept in sight; the act of looking toward this object or scene.

Viewpoint
Location from where a landscape can be seen.

Viewshed
The visible area, as it appears from one or more viewpoints.

Visual
A mental image attained by sight.

Visual Absorption Capability
The relative ability of a landscape to accept management manipulations without significantly affecting its visual character.

Visual Impact
An expression experienced by what is seen.
or
The significance and/or severity of visual resource quality change as a result of anticipated activities or land uses that are to take place (or have taken place) on or adjacent to the landscape. (A.C.E., 1984) (a) A contrasting intrusion in the unified order of landscape, seen and appreciated as a misfit in appearance or function. A visual impact contributes to a reduction in scenic values. (Tetlow, et al., 1977) (b) The degree of change in visual resources and viewer response to those resources caused by highway development and operations. (Jones and Jones, 1977)

Visual Quality
The visual significance given to a landscape determined by cultural values and the landscape's intrinsic physical properties.

Visual Quality Objective
A desired level of excellence based on scenic qualities of an area. Refers to degree of acceptable alteration of the visually characteristic landscape.

BIBLIOGRAPHY

Agriculture Canada, 1963. "National Land Capability Classification Systems of the Canada Land Inventory." Agricultural Resource and Development Act. Ottawa, ON.

Alberta Forestry, Lands and Wildlife, 1990. Bow Corridor Local Integrated Resource Plan, Draft Plan. Alberta Forestry, Lands and Wildlife, Edmonton, AB.

Army Corps of Engineers (A.C.E.), 1984. Visual Impact Assessment Procedures for U.S. Army Corps of Engineers. Prepared by the State of New York, College of Environmental Science and Forestry, Syracuse, New York.

Bishop, I.D. and P.N.A. Leahy, 1988. "Assessing the Visual Impact of Development Proposals: The Validity of Computer Simulations." Landscape Journal, Volume 8, Number 2, Fall.

Brown, Bernice S., The Delphi Process: A Methodology Used for the Elicitation of Opinions of Experts. Santa Monica, CA, The Rand Corporation, 1968.

Bureau of Land Management, 1980. Visual Resource Management Program, U.S. Government Printing Office.

Calgary Regional Planning Commission, 1977. Canmore Corridor Study: Volume 1: Inventory and Prospect.

Calgary Regional Planning Commission, 1983. Environmentally Significant Areas of the Calgary Region.

Calgary Regional Planning Commission, 1987. I.D. of Bighorn #8, South Corridor Area Structure Plan. 23 pp.

Calgary Regional Planning Commission, 1988. M.D. of Bighorn #8, General Municipal Plan. 209 pp.

Calgary Regional Planning Commission, 1988. Town of Canmore General Municipal Plan. Town of Canmore, AB.

Calgary Regional Planning Commission, 1989. Dead Mans' Flats Area Redevelopment Plan.

Cottonwood Consultants Ltd., 1990. Bow/Canmore Corridor Environmental Issues Analysis. For Alberta Tourism, Edmonton, AB.

Daffem, Gillean, 1985. Kananaskis Country Trail Guide. Rocky Mountain Books, Calgary, AB.

Forest Service, Alberta Forestry, Lands and Wildlife, 1988. Forest Landscape Management Strategies for Alberta, Edmonton, AB.

Jones and Jones, 1977. Esthetics and Visual Resource Management for Highways. Prepared by Jones and Jones for the U.S. Department of Transportation, Federal Highway Administration, National Highway Institute and Office of Environmental Policy.

Lamoureux, R., G. Chow and B. Reeves, 1983. Environmentally Significant Areas Study. Calgary Regional Planning Commission, Calgary, AB., 257 pp.

Long, Mayell and Associates, Architect and Environmental Planners, 1977. Banff Townsite Architectural and Environmental Guidelines. Parks Canada.

O'Leary, Dennis J., 1988. Integrated Resource Inventory and Evaluations of the Bow Corridor Integrated Resource Planning Area. Land Information Services Division, Alberta Forestry, Lands and Wildlife, Edmonton, AB.

Russell, William B., 1984. Evaluation of Trees and Shrubs for Coal Mine Reclamation in the Eastern Slopes. Russell Ecological Consultants, Edmonton, AB.

Smardon, Richard C., James F. Palmer and John P. Felleman, 1986. Foundation for Visual Project Analysis. John Wiley and Sons: New York.

Steber, J., 1990. Planner's Update: Bow Corridor Local Integrated Resource Plan, March 1990. Resource Planning Branch, Alberta Forestry, Land and Wildlife, Edmonton, AB.

Takyi, S.K. and R.M. Islam. Plant Cover Establishment on a Severe Rocky Mountain Foothills Site. Forest Service, Alberta Energy and Natural Resources, Edmonton, AB.

Takyi, S.K., 1984. Role of Topsoil, Fertilizers and Companion Crops in Revegetation of Two Severe Sites in the Alberta Foothills and Mountains. Forest Service, Alberta Energy and Natural Resources, Edmonton, AB.

Tetlow, R.J. and S.R.J. Sheppard, 1977. Visual Resources of the Northeast Coal Study Area 1976-1977. Prepared for the Environment and Land Use Sub-Committee on Northeast Coal Development by the Analysis/Interpretation Division Resource Analysis Branch, Ministry of Environment, Province of British Columbia, Victoria.

Urban Planning Division of the Calgary Regional Planning Commission, 1986. Town of Canmore Downtown/Highway Commercial Area Redevelopment Plan. Town of Canmore, AB.

Van Waas, N., 1976. Biophysical Analysis and Evaluation of Capability, Canmore Corridor. Resource Evaluation Branch, Alberta Energy and Natural Resources, Edmonton, AB.

Yaro, Robert D,. Randall G. Arendt, Harry L. Dodson, and Elizabeth A. Brabee, 1988. Dealing with Change in the Connecticut River Valley: A Design Manual for Conservation and Development. Lincoln Institute of Land Policy and the Environmental Law Foundation, Cambridge, MA.

APPENDICES

PAGE

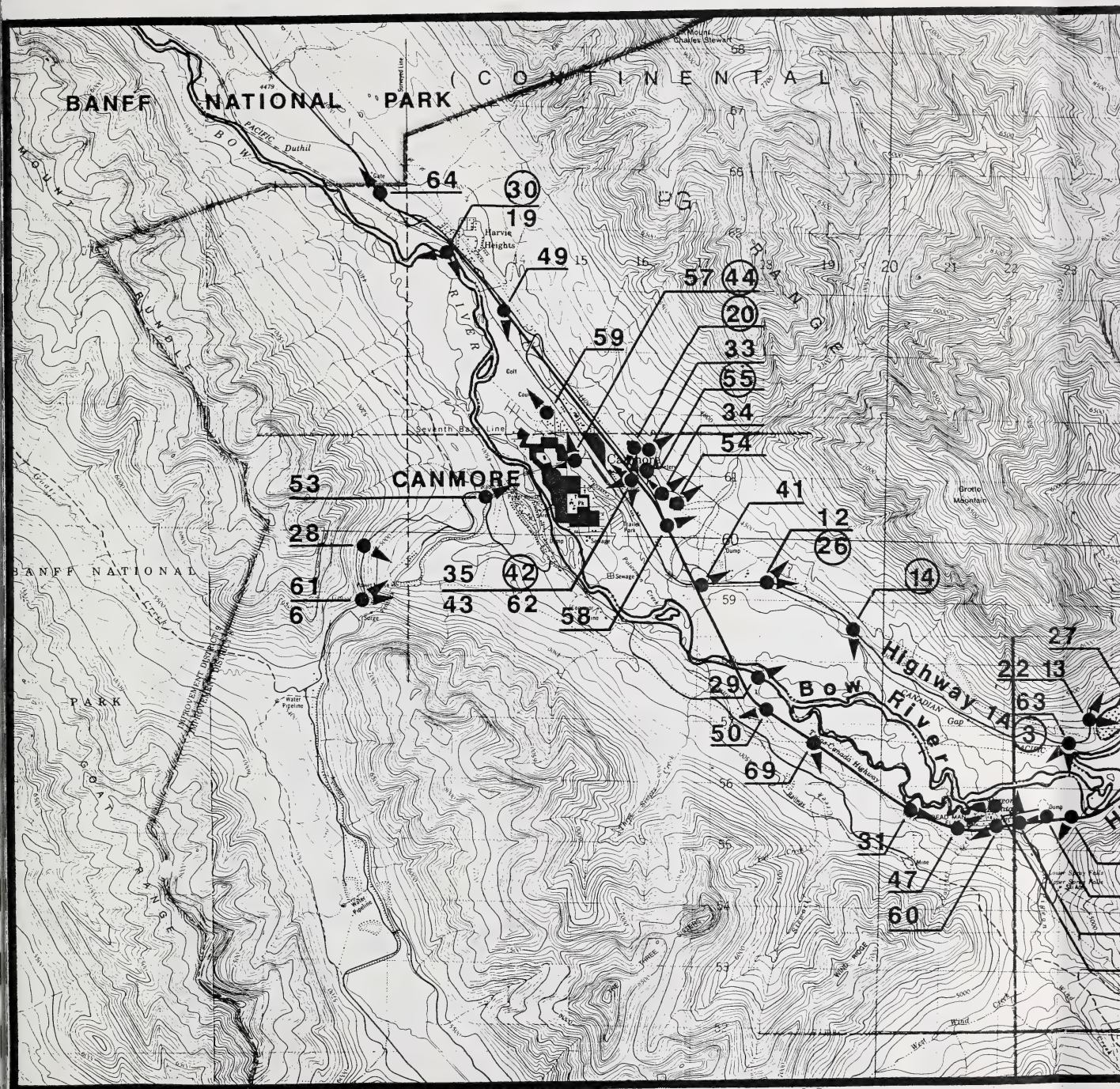
APPENDIX I: MAPS 59

APPENDIX II: DATA FLOWCHARTS 77

APPENDIX III: DELPHI GROUP MEETINGS AND RESULTS 83

APPENDIX I: MAPS

1. Viewpoint Locations for Evaluation
2. Frequency of Areas Seen from Eight Most Important Viewpoints
3. Areas of Scenic Significance
4. Comparison of Visual Quality Objectives and Unseen Areas from Highways 1, 1A and Eight Most Important Viewpoints
5. Ecology
6. Comparison of Visual Quality Objectives and Wildlife Suitability
7. Zoning
8. Comparison of Visual Quality Objectives and Potential Development Envelopes



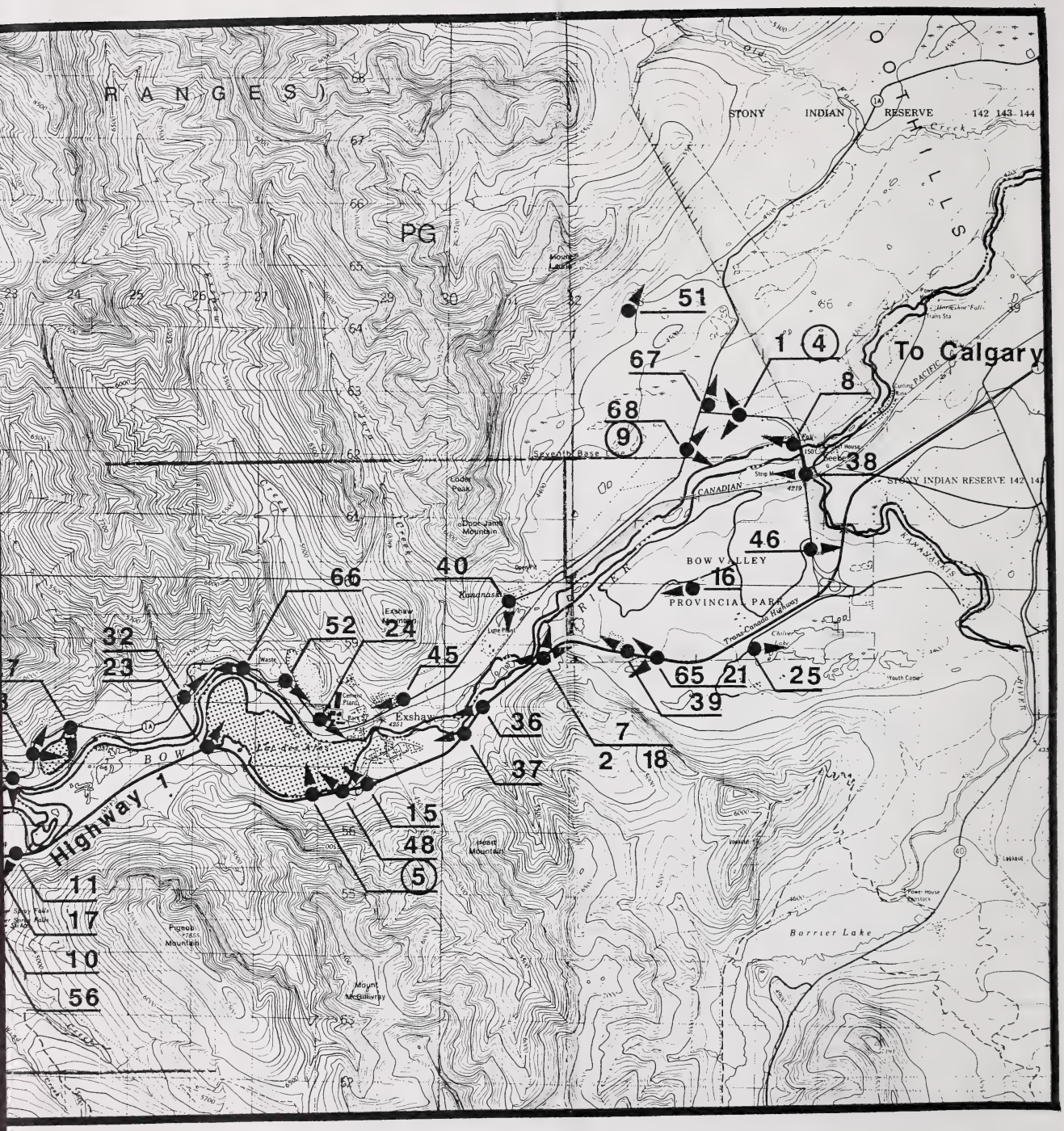
APPENDIX MAP 1: VIEWPOINT LOCATIONS FOR EVALUATIO

Bow-Canmore Visual Impact Assessment

Alberta, Canada

Prepared for:
Alberta Tourism

Prepared by:
Landplan Associates, Ltd. and Design Workshop, Inc.

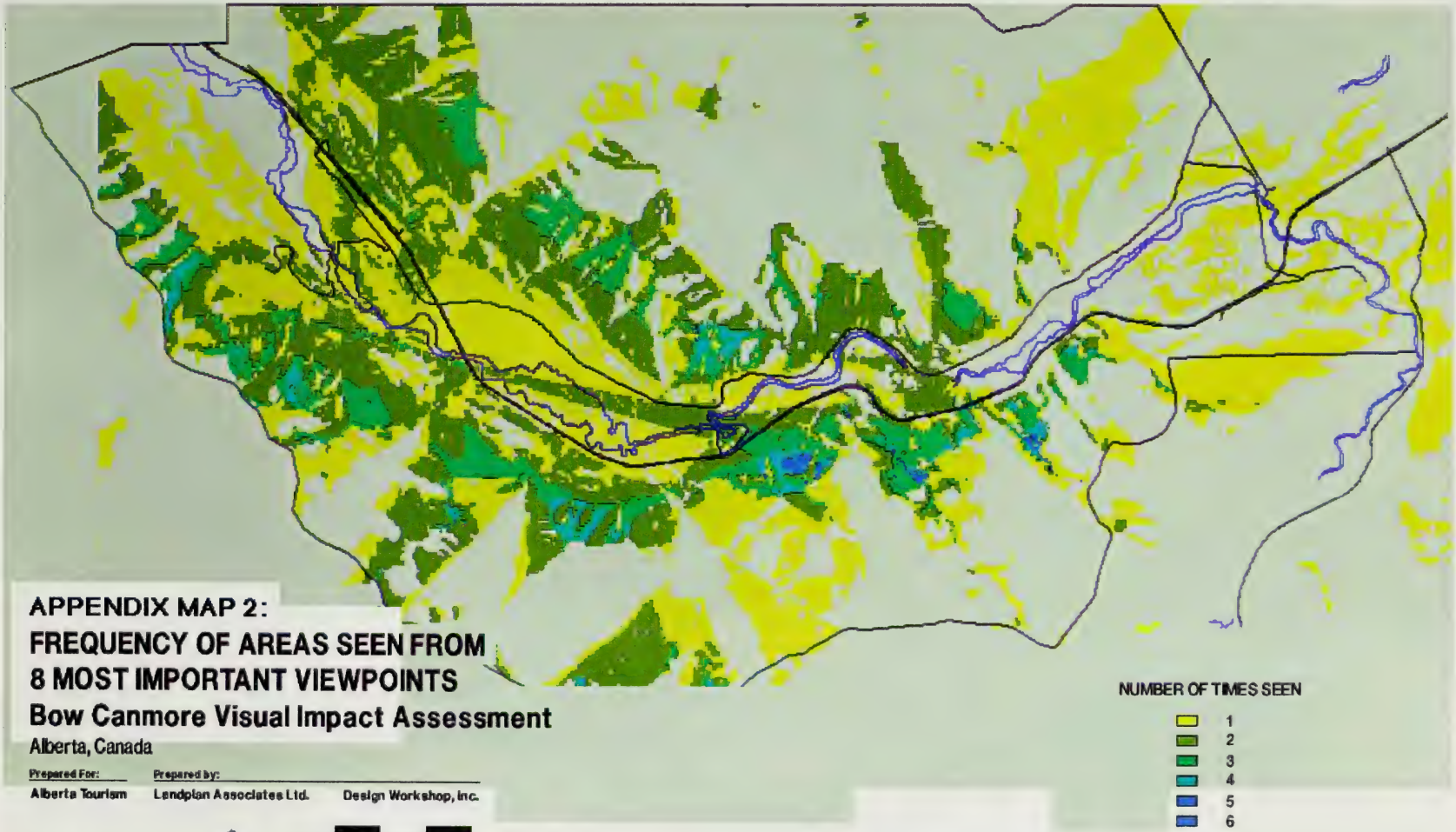


TION

17 69 Viewpoint Locations for Visual Quality Rating

5 11 Viewpoint Locations for Computer Simulation

North 0km 1.6km 3.2km


APPENDIX MAP 2:
FREQUENCY OF AREAS SEEN FROM
8 MOST IMPORTANT VIEWPOINTS
Bow Canmore Visual Impact Assessment
Alberta, Canada
Prepared For:
Alberta Tourism
Prepared by:
Landplan Associates Ltd.
Design Workshop, inc.
March, 1991
North
0km 1km 2km 3km 4km
NUMBER OF TIMES SEEN
1
2
3
4
5
6

APPENDIX MAP 3:

AREAS OF SCENIC SIGNIFICANCE

Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

APPENDIX MAP 4:

COMPARISON OF VISUAL QUALITY OBJECTIVES AND UNSEEN AREAS

Bow Canmore Visual Impact Assessment

Alberta, Canada

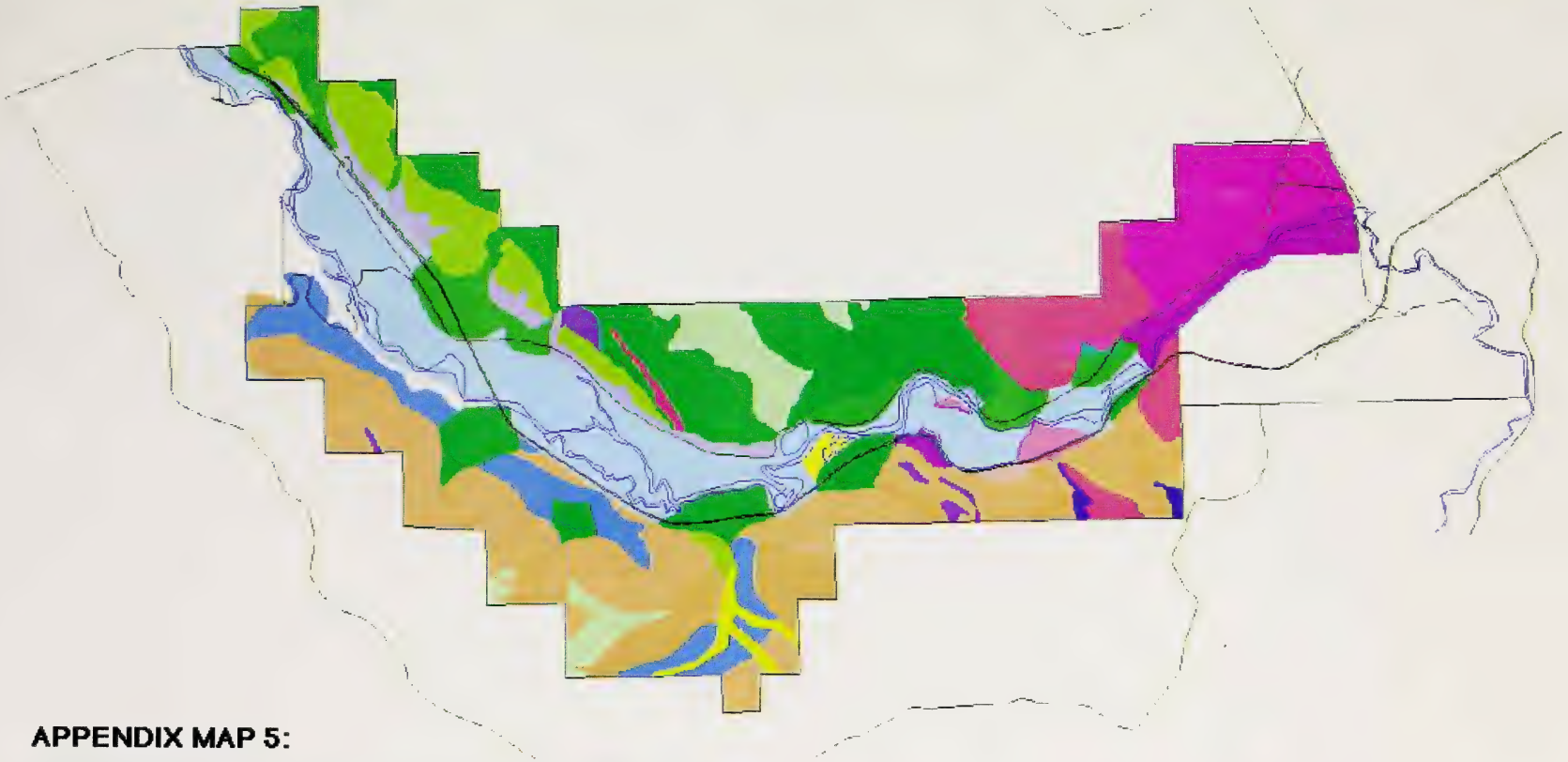
Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km



APPENDIX MAP 5:
ECOLOGY
Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

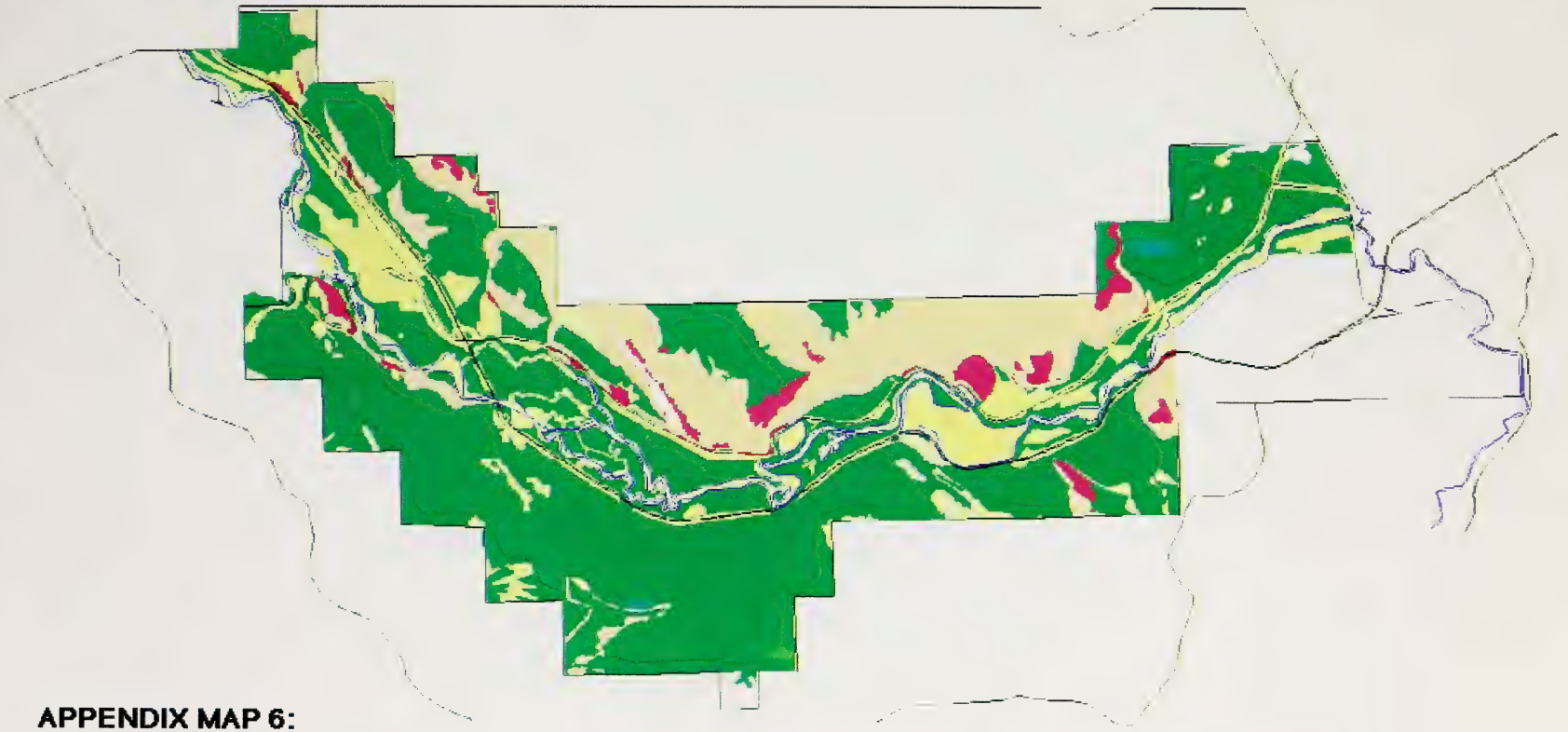
Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

FR.C1
FR.C2
FR.C3
FR.C4
FR.C5
FR.C6
FR.C7
FR.CR1
FR.CR2
FR.E1
FR.F1
FR.F2
FR.F3
FR.F4
FR.F5
FR.GF1
FR.GF2
FR.M1
FR.R1
FR.X1
RP.F1
RP.F2
RP.GF1
RP.GF2
RP.GF3
A



APPENDIX MAP 6:

COMPARISON OF VISUAL QUALITY OBJECTIVES AND WILDLIFE SUITABILITY

Bow Canmore Visual Impact Assessment

Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

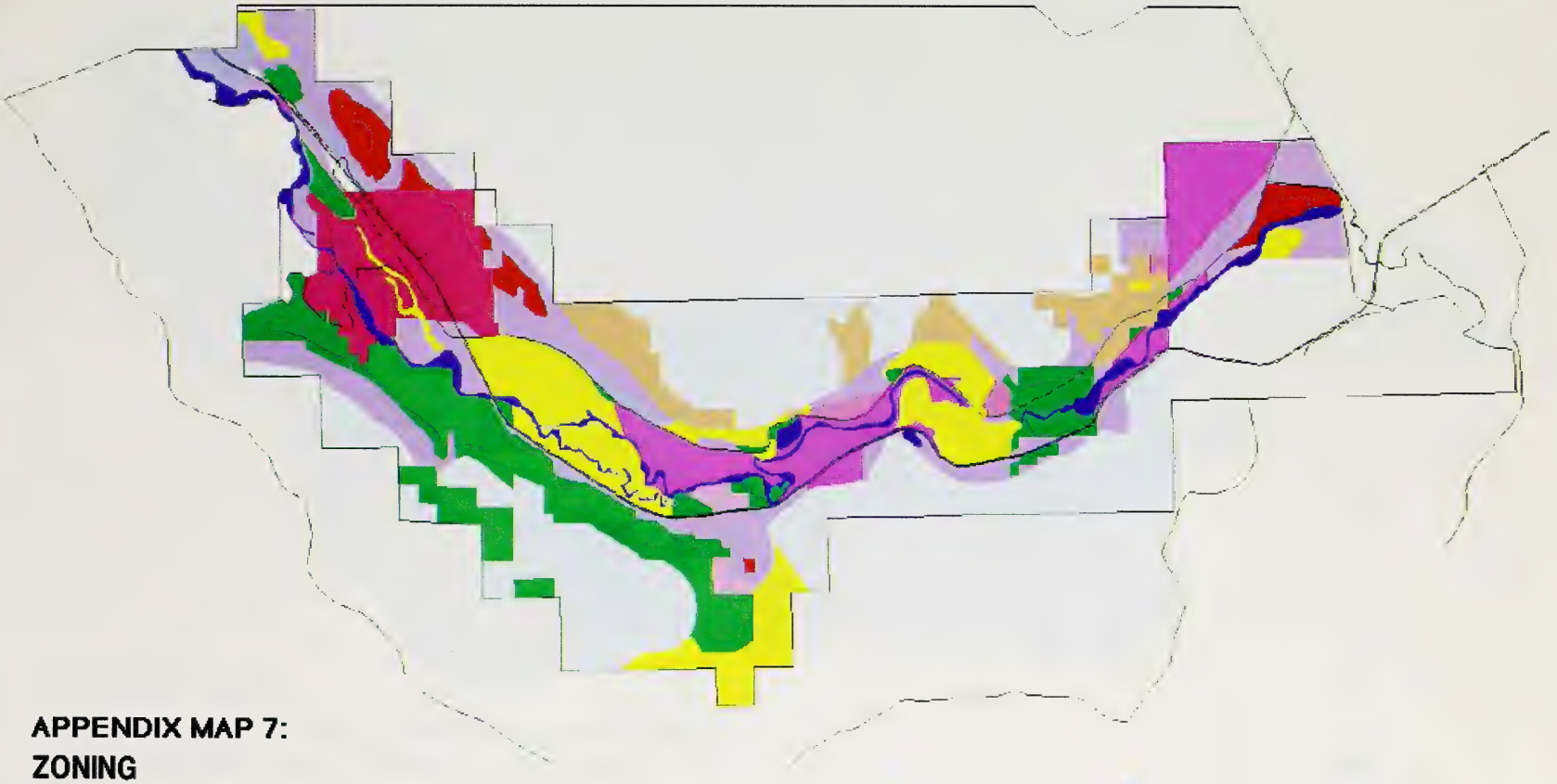
March, 1991

North

0km 1km 2km 3km 4km

VISUAL IMPACT

- Supportive
- Neutral
- Partially Conflicting
- Conflicting
- Different



APPENDIX MAP 7:
ZONING
Bow Canmore Visual Impact Assessment

Alberta, Canada

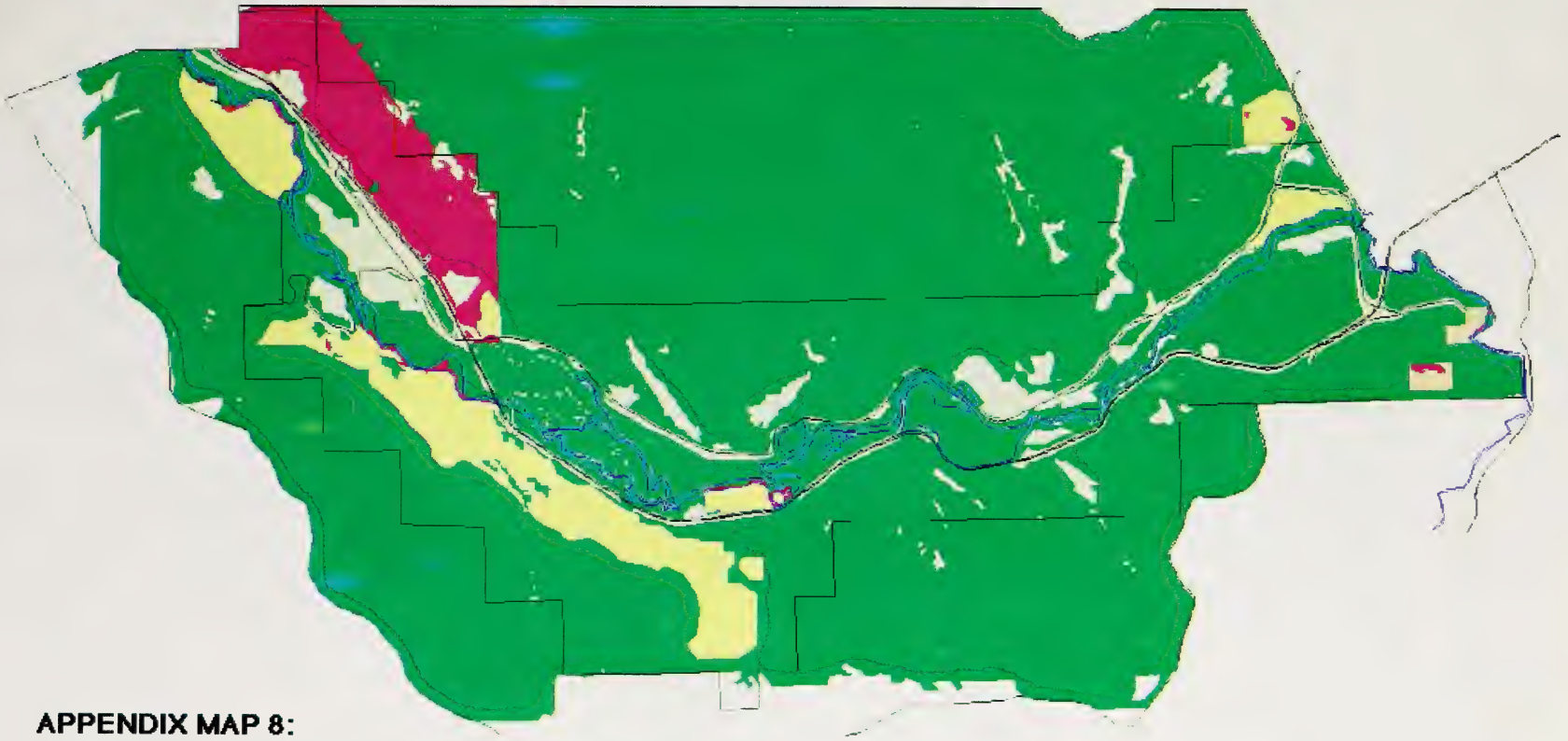
Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km



APPENDIX MAP 8:
COMPARISON OF VISUAL QUALITY OBJECTIVES AND POTENTIAL DEVELOPMENT ENVELOPES
Bow Canmore Visual Impact Assessment
Alberta, Canada

Prepared For: Alberta Tourism

Prepared by: Landplan Associates Ltd. Design Workshop, Inc.

March, 1991

North

0km 1km 2km 3km 4km

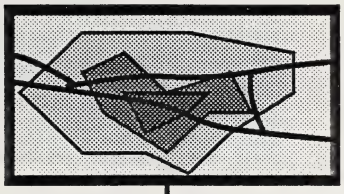
VISUAL IMPACT
- Supportive
- Neutral
- Partially Conflicting
- Conflicting
- Different

APPENDIX II: DATA FLOWCHARTS

1. Data Flowchart for Visual Quality Map
2. Data Flowchart for Visual Quality Objectives Map

Data Flowchart for Visual Quality Map

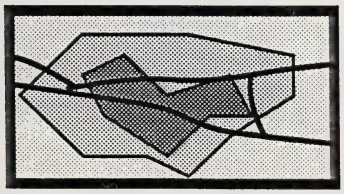
Map 4.1
Landscape Character



Recode Landscape Character Types based on results of Delphi Group Exercise

*Rocky Mountain Peaks *Rivers and Lakes	*Coniferous Forests *Mixed Vegetated Areas *Meadows	*Reservoirs and minor impacts to water *Minor impacts to vegetated areas	*Major Roads	*Rocky vegetated slopes *Towns *Hamlets/ Residential *Highway Commercial	*Mines/ Industrial Plants
↓	↓	↓	↓	↓	↓
Very Beautiful to Beautiful	Beautiful	Beautiful to Moderate	Moderate	Moderate to Ugly	Ugly to Very Ugly

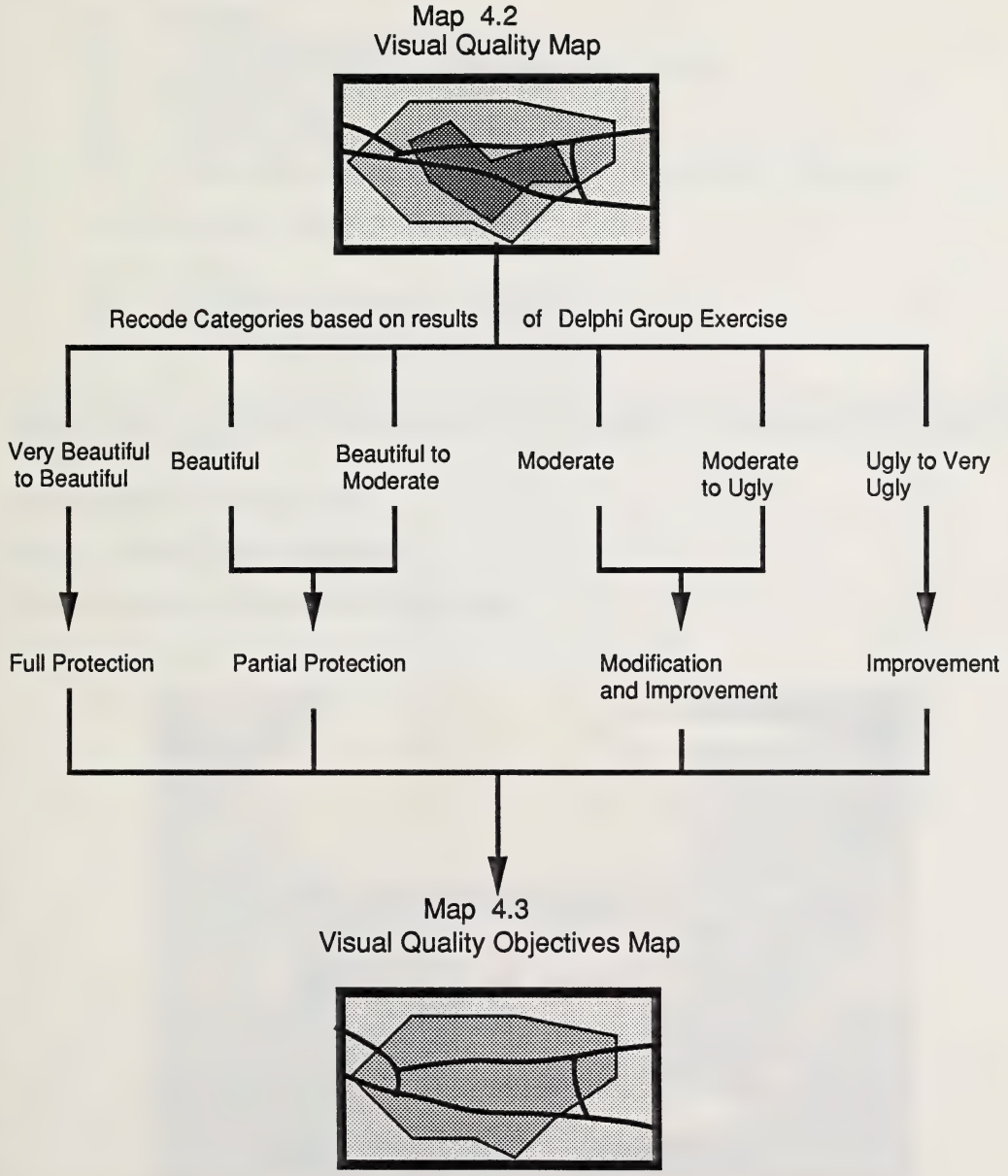
Map 4.2
Visual Quality



Note: Map # refers to map number in the Technical Appendix

APPENDIX FIGURE 1:
Data Flowchart for Visual Quality Map

Data Flowchart for Visual Quality Objectives Map



ote: Map # refers to map number
in the Technical Appendix

APPENDIX FIGURE 2:
Data Flowchart for Visual Quality Objectives Map

APPENDIX III: DELPHI GROUP MEETINGS AND RESULTS

1. Group Meeting August 20, 1990

1.1 Agenda
1.2 Visual Quality Evaluation Results
1.3 Comparative Scenic Quality Evaluation Summary
1.4 Relationship to Visual Quality Objectives
1.5 Visual Concept
1.6 Most Important Viewpoints
1.7 Photographs of Existing Conditions for Visual Quality Evaluation

2. Group Meeting September 29, 1990

2.1 Agenda
2.2 Evaluation of Acceptable Modification
2.3 Summary of Scenic Quality Evaluation
2.4 Summary of Guidelines Worksession

Please note that this section contains certain terms which are similar in meaning, but not the precise words used in the body of the text, as the precise words evolved in the course of the study. These include:

Scenic Quality - Visual Quality

Change - Visual Quality Objectives

Visual Objectives - Visual Quality Objectives

1. GROUP MEETING AUGUST 20, 1990

1.1 Agenda

BOW-CANMORE VISUAL IMPACT ASSESSMENT
DELPHI GROUP MEETING
Monday, August 20, 1990
Canmore, Alberta

Mapping of Visual Quality Objectives and Key/Representative Viewpoints

AGENDA

1. Welcome and Introduction - Randy Leal — 15 min.
   - Evening's Agenda
   - People introduce themselves
   - General description of Alberta Tourism
   - Framework and the Visual Impact Assessment
   - Important Role of Group

2. Visual Impact Assessment Project Description - Brian Baker 10 min.
   - Relationship of Delphi Group tasks to
   - Project Final Product
   - Project Update, present graphics

3. Role of Public Group - Suzanne Jackson — 5 min.
   - Relationship of 2 project sessions
   - Two goals for tonight - mapping of visual quality objectives and of Key/Representative Viewpoints

4. Mapping of Visual Quality Objectives - Suzanne & Brian

   a. Introduction — 5 min.
   Describe board of 69 photographs which represent the landscape types (numbered 1-69). Photographs referenced to 1:20,000 View Map.

   b. Evaluation (Whole Group) — 15 min.
   Group breaks into 5 groups of 4 to 5 to discuss the relationship between:

Very Beautiful	Total Protection
Beautiful	Partial Protection
Moderate	Modification
Ugly	Improvement
Very Ugly	

   Each group presents a table of relationships. The results are tallied on the board for final consensus. The evaluation categories are reclassified for change on the photos.

5. Mapping of Viewpoints - Suzanne & Brian 45 min.

a. Areas seen from (Sub-groups)

Group breaks into 5 groups of 4 to 5. They discuss the most important viewpoints, then mark these on the 1:50,000 Canmore topographical map. The areas from which views are seen are marked as follows:

i) An area or a point o of view.

ii) The direction of a view should be shown as a single arrow or a viewshed .

Groups create one map. Viewpoints may also be written down. These results will be collated, displayed and the process repeated until consensus is reached. The final map will be drawn and displayed.

BREAK 15 min.

5. b. Areas Seen 45 min.

i) The photographs previously evaluated will be shown. The 12 most important/representative views are written down by each person. People will be asked to write down any views not included, that they think should be and why they chose the 12 views. The results are tallied and the process repeated until consensus is reached. The selected 12 views are marked on the board and the map.

ii) In the last stage, each person will be asked to identify their visual character image for the area. "What view or visual image most represents your idea of what the visual character of the Bow-Canmore area -
1) is
2) should be".

6. Conclusion - Brian and Randy 5 min.

- Summary of findings
- Look forward to next meeting
- Thanks for coming

TOTAL 3 hours 30 min.

1.2 Visual Quality Evaluation Results

DELPHI GROUP
August 20, 1990
LANDSCAPE CHARACTER TYPES VISUAL QUALITY EVALUATION

A. NATURAL

1. Rivers and Lakes

6	*	B
16	*	VB
27	*	VB
30	*	VB
48	*	B
69		B

2. Coniferous Forest

3	*	VB
11		B-M (bad slide)
49		B (road edge)
63		B

3. Mixed Vegetation

4	*	B
12		M
62		B

4. Meadows

1		M (overexposed slide)
9	*	B
25		B

5. Rocky Vegetated Slopes

21	M-U
22	M-U

B. MINOR IMPACTS

1. Reservoirs and minor impacts to water

8		B-m
14	*	B-m
15		M
28		B-U (aerial)
61	*	B-M (aerial)

2. Vegetated areas with minor impacts

19	*	B (some railway)
33		VB (least road)
46		U (RV park)
55	*	B (cemetery & rocks)
59	*	B-M (golf course)
67		B-M (most road)

C. MANMADE

1. Major Roadways

Route 1 (mainly forested slopes and background peaks)

17		M
20	*	B-M (higher view)
31		M
34		M-U (interchange)
35		M
36		M
37		M
50		M
64		M
65		M
68		M

Route 1a (mixed slopes with rock)

18		M-U (more road in shot)
32		M
66		M

---

* 18 Selected Important Views
VB Very Beautiful
B Beautiful
M Moderate
U Ugly
VU Very Ugly

DELPHI GROUP
August 20, 1990
LANDSCAPE CHARACTER TYPES VISUAL QUALITY EVALUATION (PAGE TWO)

2. Town Core

41		M-U
		(more industrial)
44	*	M-U
53		M
57		M-U

3. Hamlets/Residential

42	*	M
		(more vegetation)
45		U
		(more strip)
54		M-U
58		M-U

4. Highway Commercial

43		U-M
47		U
56		M-U
60		M

5. Mines/Industrial Plants

2		M-U
5	*	U
		(mid to back)
7	*	U
		(mid to back)
10		VU
13		M-U
		(water)
23		VU
24		U
26		VU
29		M-U
		(water)
38		VU
39		U
40		U
		(plant)
51		VU
52		U

---

* 18 Selected Important Views

VB Very Beautiful
B Beautiful
M Moderate
U Ugly
VU Very Ugly

1.3 Comparative Scenic Quality Evaluation Summary (Other Groups)

DELPHI GROUP, DESIGN WORKSHOP, INC. & STEERING COMMITTEE
August 20, 1990, August 30, 1990
VISUAL QUALITY EVALUATION SUMMARY

Landscape Character Type	DELPHI Rating	DWI Rating	ST. COMM. Rating
NATURAL			
Rivers and Lakes	VB-B	VB-B	VB-B
Coniferous Forest	B	B	B
Mixed Vegetation	B-m	B-m	B
Meadows	B-m	B-m	B
Rocky Vegetated Slopes	M-U	M-u	M
Rocky Mountain Peaks	VB-B (see group mapping)	N/A	N/A
MINOR IMPACTS			
Reservoirs and minor impacts to water	B-M	B-M	B-m
Vegetated slopes with minor impacts	B-M	B (except RV Park)	B-M
MANMADE			
Major Roadways	M	M	M
Town Core	M-U	M	M
Hamlets/Residential	M-U	M-U	M-u
Highway Commercial	M-U	M	M-U
Mines/Industrial Plants	VU-U	M	U

1.4 Relationship of Visual Quality to Visual Quality Objectives

	CHANGE			
	PROTECTION	PARTIAL PROTECTION	MODIFICATION	IMPROVEMENT
VERY BEAUTIFUL	✓✓✓✓✓			
BEAUTIFUL	✓✓✓	✓✓✓	✓	✓
MODERATE		✓✓	✓✓✓	✓✓✓✓
UGLY			✓	✓✓✓✓✓
VERY UGLY			✓	✓✓✓✓✓

1.5 Visual Concept

DELPHI GROUP
AUGUST 20, 1990
VISUAL CONCEPT

QUESTION: What view or visual image most represents your ideas of what the visual character of the Bow-Canmore area?

1. Is.
2. Should be.

A. Summary of Responses

1. a. It is an area of great beauty as a result of existing natural features, especially the mountains and rivers.
   b. There are some ugly developed areas, particularly mining scars.
   c. Some of the small town development is acceptable.
   d. Various features, which add to the area's special quality include: uniqueness, wilderness, seasonality, scale and types of views.
   e. It is the entry to the Rockies and a recreational/tourist area.

2. a. Preserve the existing beautiful character of the area.
   b. New development should be harmonious with nature.
   c. Ugly areas should be improved.
   d. Guidelines for development are needed (and implementation).
   e. "Value judgements" - no glitz, not expensive.

B. Detailed Summary

1. Is.

   a. Natural beauty:
   - Mountains (9), Rivers (6), Forest slopes (3), Meadow, rock and benches (1).
   - Mostly beautiful, natural features
   - Awe-inspiring as well as relaxing and gentle
   - Landmarks and vistas
   - Beautiful wilderness
   - Natural beauty, scenic walks
   - Beautiful mountain valley
   - Mountain and river surrounds
   - Aesthetic
   - Unique climatically spectacular
   - Beautiful mountain setting
   - Diversity of visual quality
   - War between beautiful and ugly

b. Ugly development:

- Ugly development detracts from natural scenery
- Nature and development are not integrated
- Manmade areas are ugly (2)
- Ugly scares (2)
- Ugly plant, strip development mining, industry, signs, motels - town is a hodgepodge
- Plant mars beauty
- There is no development or mining mitigation

c. Acceptable Development:

- Some manmade development okay
- Minimal development in area
- Area has quasi urban development pressures
- Town vignettes
- Hamlets and one town

d. Specialness of Area:

- Unique (2), animals or wilderness (4), seasonality add beauty (3)
- Sense of scale: Three sections entry-plant, lake, Yamnuska, body-mountain views, exit-Rundle Ridge
- Distant and close views
- Views from towns and highways

e. Entry to Rockies (3) and Recreational Area:

- Playground for workers and visitors
- Tourist attractions
- Scenic walks

2. <u>Should Be</u>

a. Preserve existing beautiful character:

- Leave as natural and untouched as possible
- Protect natural beauty, preserve and enhance (2)
- Visual character of nature cannot be improved (mother nature) (2)
- Preserve visual character
- Protect untouched areas
- No new areas for development
- Protect peaks and natural mountain setting
- Look to past when the area was scenic and clear
- Accentuate existing scenic qualities
- Pristine wilderness character
- Preserve open space
- Untrammeled unique character

b. Harmonious Development with Nature:

- Complement nature
- Preserve beautiful areas in new development
- New development to be in good taste
- Use logs, cedar and stones
- Maintain integrity of areas aesthetic appeal
- Wilderness with sensitive development
- Disguise and cover development
- Quality development should not be intrusive

c. Improve ugly areas:

- Reduce and disguise (heal) scars (2)
- Obliterate eyesores
- Screen old and new development
- Develop already developed areas
- Limit mining
- Phase out industry
- No more development
- Improve ugly areas
- Clean up where needed

d. Development Guidelines/Implementation:

- Save mountain face and benches
- Create buffer zones
- No straight lines in landscape
- Vertical screening
- Architectural and sign controls (2)
- Mitigation standards
- Public scrutiny of development
- Themes of development - mountain vistas, human scale, industrial sites, mountain communities

e. Value judgement:

- For all to enjoy
- Mother nature should triumph over human materialism
- No glitz, inexpensive area

C. Best Quotes

"Some of the visual character is really awesome...while other areas are very gentle."

"Sheer mountain peaks, clear sparkling mountain streams, abundant wildlife - minimal development."

"The Bow Corridor appears as a war between beauty and ugliness."

"On the verge of a tremendous push for development."

"Gateway to National and Provincial Parks"

"A playground for people (to be)...enjoyed by all the world"

"Where development has occurred there has been little attempt to ameliorate impact"

"The area is a beautiful mountain setting interspersed with hamlets and one town. A number of industrial plants mar the basic beauty."

D. Named Places

1. Ugly:
- ☐ Cougar Creek Urban Sprawl (proposed)
- ☐ Scar on Grotto Mountain
- ☐ Ski area on Pigeon Mountain
- ☐ Cement Plant
- ☐ Lime Quarry

2. Beautiful:
Mount Lougheed, Wind Ridge (2), Grotto Mountain (3), Yamnuska (3), Pigeon Mountain (2), Lady McDonald (2), Heart Mountain, Three Sisters (2), Rundle Ridge, Heart Creek Falls, Grassi Lakes, Lac des Arcs

1.6 Most Important Viewpoints

DELPHI GROUP & STEERING COMMITTEE
August 20, 1990
TOP 18 SELECTED VIEWS - CORRESPONDENCE WITH MAPPING EXERCISE

Photo #	Scenic Quality Evaluation	Delphi Group Votes	Corr. w/ Delphi Mapping	Selected for Sim.
27	VB	17	✓	●
3	VB	15	✓	●
55	B	12	✘	●
6	VB	11	✓	
16	VB	11	✘	
4	B	10	✓	●
44	M-U	10	✓	●
20	B-M	10	✘	●
30	VB	10	✘	●
59	B-M	8	✘	
19	B	7	✘	
5	U	7	✓	●
48	B	6	✓	
14	B-M	6		●
61	B-M	5	✓	
9	B	5		●
42	M	5	✘	●
7	U	5		
26				●

✓ most clearly correspond with mapping
✘ correspond to some extent with mapping

Other important views in mapping:

- Spray Falls
- Views from Exshaw
- Views from Heart Mt. and other mountains

1.7 Photographs of Existing Conditions for Visual Quality Evaluation

37
M

49
B

51
VU

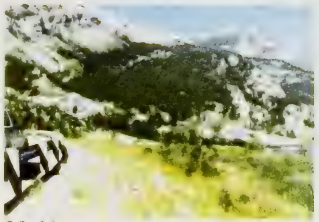
52
U

36
M

50
M

38
VU

39
U

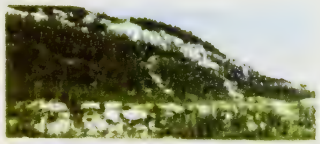


22
M-U

68
M

23
VU

40
U



21
M-U

VB	VERY BEAUTIFUL
B	BEAUTIFUL
B-M	BEAUTIFUL - MODERATE
M	MODERATE
M-U	MODERATE - UGLY
U	UGLY
VU	VERY UGLY

57
M-U

58
M-U

59
B-M

60
M

53
M

54
M-U

55
B

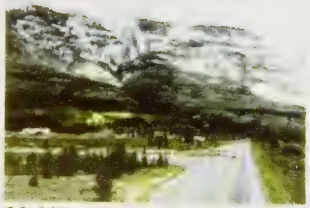
56
M-U

44
M-U

45
U

46
U

47
U



41
M-U

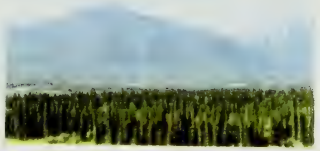
42
M

VB	VERY BEAUTIFUL
B	BEAUTIFUL
B-M	BEAUTIFUL - MODERATE
M	MODERATE
M-U	MODERATE - UGLY
U	UGLY
VU	VERY UGLY

43
M-U

25
B

26
VU



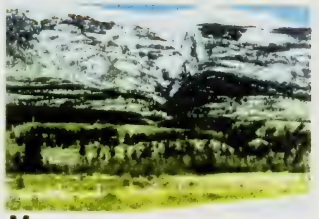
63
B

62
B

9
B

10
VU

3
VB



12
M

1
M

2
M-U

11
B-M

4
B

24
U

VB	VERY BEAUTIFUL
B	BEAUTIFUL
B-M	BEAUTIFUL - MODERATE
M	MODERATE
M-U	MODERATE - UGLY
U	UGLY
VU	VERY UGLY

48
B

28
B-U

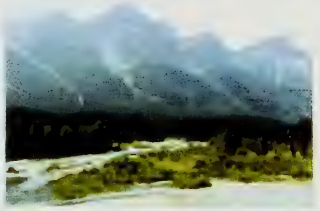
14
B-M

69
B

27
VB

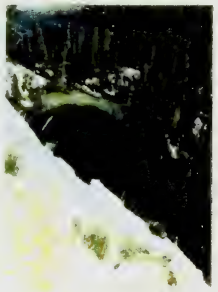
61
B-M

29
M-U



30
VB

13
M-U



6
B

15
M

16
VB

5
U

7
U

8
B-M

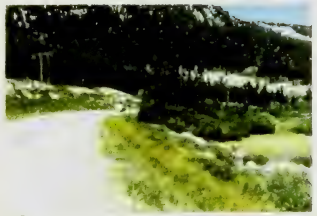
65
M

66
M

67
B-M

64
M

31
M



32
M

33
VB

34
M-U

7
M

18
M-U

19
B

35
M

VB VERY BEAUTIFUL
B BEAUTIFUL
B-M BEAUTIFUL - MODERATE
M MODERATE
M-U MODERATE - UGLY
U UGLY
VU VERY UGLY

20
B-M

2. GROUP MEETING SEPTEMBER 29, 1990

2.1 Agenda

BOW-CANMORE VISUAL IMPACT ASSESSMENT
Second Delphi Group Meeting
Saturday, September 29, 1990
Nakoda Lodge, Alberta

Determination of Acceptable Levels of Modification and Guidelines

AGENDA

1. Welcome
2. Project Update
   - Project Overview
   - Role of Delphi Group and Summary of Previous Results
3. Evaluation of Acceptable Modification
   - Delphi System - Slide Presentation
4. Development of Unseen Areas
   - Group Discussion

BREAK

5. Formulation of Guidelines
   - Group Discussion - Photographic References
6. Summary of Scenic Quality Evaluation
   - Delphi System - Slide Presentation
7. Conclusion

2.2 Evaluation of Acceptable Modification

BOW CANMORE VISUAL IMPACT ASSESSMENT
DELPHI GROUP, SEPTEMBER 29, 1990
EVALUATION OF ACCEPTABLE MODIFICATION

Order	Description	Slide #	Evaluation
3.	**MT. LOUGHEED - CONIFEROUS FOREST**		
3A	Golf Course	3v2	same (better to worse)
3B	Resort Development	3v3	worse
3C	Golf Course and Resort	3v4	worse
3D	Resort and Valley Development	3v5	much worse
3E	Poles	3v1	same
4.	**YAMNUSKA - MIXED FOREST**		
4A	Road	4m1	worse
4B	Natural Golf Course	4m3	worse
4C	Increased Trails	4m5	same
4D	High Maintenance Golf Course	4m4	better to worse
9.	**MEADOWS**		
9A	No Fence	9m3	better
9B	High Maintenance Golf Course	9m1	much better to very worse
9C	Lower Maintenance Golf Course	9m1a	worse (much better to much worse)
9D	RV Park	9m2	much worse
9E	Foreground Poles	9m3p	worse (to much worse)
9F	Background Poles	9m4	worse (to same)
14.	**RAILROAD AND RIVER - MINOR IMPACTS TO WATER**		
14A	Exposed Golf Course	14c1	better to much worse
14B	Existing	14c	same
14C	Concealed Golf Course	14c2	same
55.	**CEMETERY AND HOODOOS - MINOR IMPACTS TO VEGETATION**		
55A	Improved	55c1	better
55B	Small Road	55c2	worse
55C	Larger Road	55c2a	much worse
55D	Viewpoint Development	55c3	very worst

Order	Description	Slide #	Evaluation
20.	**INTERCHANGE AND THREE SISTERS - MAJOR ROADWAYS**		
20A	Widened Road and Access	2012	same (a bit worse)
20B	Tree Planting	20i1	same (a bit better)
20C	Golf Course and Development	20i4a	worse (better to very worst)
20D	Golf Course - Increased Clearing	20i3	better to very worst
20E	Golf Course - Less Clearing	20i3a	better to

* Note: 20E is a bit better than 20D

44.	**CANMORE - TOWN CORE**		
44A	No Cars	44t2	better to same
44B	Wire Across Street	44t4	same
44C	No Trees	44t1	worse
44D	New Lamp Posts	44t5	better
44E	Two Story Building	44t3	same to worse
42.	**CANMORE HIGHWAY - HIGHWAY COMMERCIAL/HAMLET**		
42A	Strip Development	42r1a	worse to much worse
42B	Major Background Development	42r1c2	same to much worse
42C	Strip Development with Major Background Development	42r1b2	worse to very worst
42D	Strip Development with Background Development	42r1b	worse to much worse
61.	**FROM SPRAY LAKES - GENERAL OVERVIEW**		
61A	Golf Course	61m2	same
61B	Strip Development	61m3	same to worse
61C	Golf Course and Benchland Development	61m5	better to much worse
61D	Revegetation	61m1	better to same
61E	Benchland Development	61m4	same to worse

Order	Description	Slide #	Evaluation
26.	**STRIPMINE - MINE/INDUSTRIAL PLANT**		
26A	Painted and Revegetated	26m1b	much better
26B	Increased Mining	26m2	worse to much worse
26C	Painted	26m1a	same
26D	Totally Revegetated	26m1c	very best to much better
26E	Painted and Strip of Trees	26m1a2	better
5.	**MINE AND INDUSTRIAL PLANT**		
5A	Light Grey Paint	5m1a	same
5B	No Plant	5m1b	much better
5C	Mine and Plant Coloured Grey	5m1	better to same
5D	Mine and Plant Removed	5m2b	very best
5E	Mine Lowered and Revegetated	5m2	better
5.	**INDUSTRIAL PLANT**		
5F	Camouflage	5m1d	worse
5G	Grey with Speckled Texture	5m1fz	worse
5H	Pot Art Trees with Miami Colours	5m1hz	worse
5I	Pot Art Trees with Reduced Miami Colours	5m1hzz	same to worse
5J	Mimick Lines in Landscape	5m1gz	better
5K	Modern Caulder Approach	5m1ez	worse

Note: 5F to G had a range of responses from much better to much worse, though they concentrated on the area marked.

2.3 Summary of Scenic Quality Evaluation

Delphi Group Rating - September 29, 1990

Reorganized

	Slide Number	Rating from First Meeting (Aug. 20)	Rating from Second Meeting (Sept. 29)
Existing			
1.	1	M	B-M
2.	7	U	M-U
3.	16	VB	VB
4.	18	M-U	M-U
5.	19	B	B
6.	25	B	VB-B
7.	27	VB	VB
8.	29	M-U	B-U
9.	47	U	U
10.	38	VU	VU
11.	58	M-U	M-U
12.	66	M	M
Modified			
13.	5e	U	U-VU
14.	5m1d		VU
15.	5m1ez		U-VU
16.	5m2b		B
17.	20e	B-M	M
18.	26m1c		B-M
19.	26m2	(26e-VU)	U-VU
20.	61e	B-M	M
21.	61m2a		M-u
22.	61m5		M

2.4 Summary of Guidelines Work Session

BOW CANMORE VISUAL ASSESSMENT
GUIDELINES AND RECOMMENDATIONS
SUMMARY OF DELPHI GROUP RESULTS
SEPTEMBER 29, 1990

Please note that "★" means mentioned at least twice.

Partial Protection

CONIFEROUS FORESTS

Objectives

- Development to be located in lower areas of valley.
- Use visual buffers, specifically natural landscape screening.
- Do not locate development on edges.
- ★ **Establish architectural guidelines.**
- ★ **Establish height controls.**
- Develop in recessed areas.
- Preserve natural conditions such as trees, rivers and wildlife.
- In golf courses, minimize clearing for fairways.

Partial Protection

MIXED VEGETATION

Objectives

- Develop trail standards to minimize visual impact.
- Development to be complementary to the natural environment and vegetation.
- Use trees and landform as visual buffers.
- Create restrictions for motorized vehicles.
- ★ **Develop sign controls and standards.**
- Golf courses are to look as natural as possible.

Partial Protection

MEADOWS

Objectives

- Development to be complementary to the natural environment and vegetation.
- ★ **Utilities to be underground and screened from view.**
- In golf courses, minimize clearing for fairways and use natural landscaping.
- Preserve some open meadow areas.
- Preserve endangered flora and fauna.
- Screen RV campsites from view.

Partial Protection

MINOR IMPACTS TO WATER

Objectives

- Preserve natural shoreline vegetation (no modification).
- Preserve natural water courses (no modification).
- Development to have natural screening on shoreline.
- Prevent discharge of harmful materials into water courses.
- Create buffer zones between development and water courses.

Partial Protection

MINOR IMPACTS TO VEGETATION

Objectives

- Development to follow natural topography.
- Revegetate with indigenous species of area.
- Preserve significant landscape features, for example, rare plants and landforms.
- Maintain existing vegetation characteristics to the maximum.
- Remove fewest possible trees.
- Use vegetation as visual buffer and to enhance development.
- Minimize road width, use direction roadways.
- Create sign standards.

Modification and Improvement

MAJOR ROADWAYS

Objectives

- ⋆ **Vegetate medians and turnpikes with trees and shrubs** in natural clusters (use indigenous species).
- Minimize signage, create sign standards for color and lettering, (brown post and green sign suggested).
- Keep tree edge uneven and natural, maintain contours.
- Limit development to existing roadways, limit construction of new roadways.

Modification and Improvement

TOWN CORE

Objectives

- ★ **Underground utilities.**
- ★ **Develop architectural standards and landscape guidelines (trees).**
- ★ **Use consistent local building materials and character.**
- • Create height and setback restrictions.
- • No strip development - integrate businesses with services and create architectural guidelines so the development is not too commercial looking.
- ★ **Signage standards, no neon.**
- ★ **Create a pedestrian mall** - in central 2 blocks.
  - in Main Street.
- • Create remote parking.
- • Use naturally blending colors and a high degree of landscaping. Suggested materials are: trees, cobblestones and natural timbers.

Modification and Improvement

HIGHWAY COMMERCIAL/RESIDENTIAL HAMLETS

Objectives

- • Underground utilities.
- • Use natural screening along highway.
- ★ **Create signage and architectural control and landscape controls - set backs, height restrictions, color to blend with surroundings.**
- • Create a landscape screen between the highway and development.
- • Signage should be only informational, not commercial.
- • No "strip" development.
- • Minimize visual impact of development using height and color control.
- • Landscape medians.

Partial Protection

GENERAL OVERVIEW

Objectives

- Create height restrictions based on the areas topography and density of development, for example 75% vegetation, 25% housing.
- Reclaim and vegetate disturbed areas.
- Do not clear cut ROW's - create less obtrusive utility corridors.
- Development to blend with environment, create color controls.
- Pay special attention to views from scenic viewpoint.
- Retain vegetation.
- Visually screen traffic routes.
- Minimize golf fairways and maintain the natural setting.
- Visually screen development.
- Limit the development of golf courses relative to need, create development rate controls.

Improvement

MINE/INDUSTRIAL PLANT

Objectives

★ **Do not allow any more strip mines in upper Bow River Corridor.**

- Do not allow any more new resource industry.
- Reclamation standards to be set and enforced.
- Industry and government to work together.
- Restore natural setting.
- Selectively revegetate with contours of mountains.
- Blast some relief into the sides of scars to create shadows.
- Reclaim existing scars.
- Conceal mining processes or terminate existing licenses.
- No more licenses or renewal of agreements,
  Specifically for the Lafarge Industrial Plant and Mine.
- Reclamation plan essential
- Use natural screening to minimize sky line impact of buildings.
- Paint is not the way to go.
- Paint in a subdued manner to minimize impact and blend with background.
- Recontour hill in immediate background.
- Of the paint schemes on the board, "a" and "e" are best; "f", "g", "h" are worst.

N.L.C. - B.N.C.
3 3286 11881997 4